MARCH 2, 1935

Railway Age

Founded In 1856

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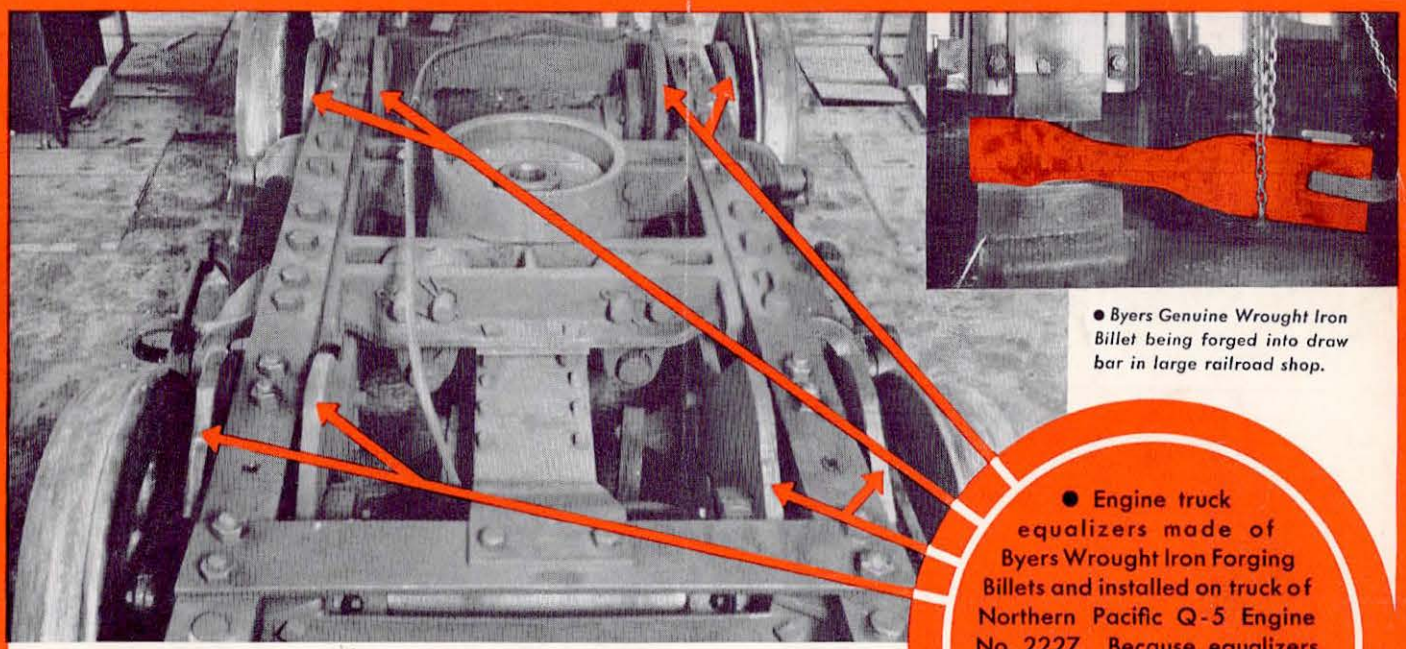
BYERS Wrought Iron BILLETS

Used by 28 Railroads



● *Byers Genuine Wrought Iron Billet being forged into draw bar in large railroad shop.*

● Engine truck equalizers made of Byers Wrought Iron Forging Billets and installed on truck of Northern Pacific Q-5 Engine No. 2227. Because equalizers are subjected to extremely severe vibration, this is one of the many services where Railroads prefer Wrought Iron.

DURING the past few years, when railroad purchases were under close scrutiny, 28 railroads purchased Byers Genuine Wrought Iron Billets.

No group buys more wisely — no group is better informed on materials . . . and may we add . . . no group is making wider use of the corrosion and fatigue resisting qualities of Byers Wrought Iron than the railroads.

With Byers Wrought Iron, a railroad standby for over 70 years, it's no wonder *many* railroads would be using it in the form of billets as well as pipe, plates and sheets. Byers Wrought Iron Billets possess just those qualities of strength, toughness, fatigue resistance and uniformity of structure that make them desirable for modern railroad fabrication and service requirements... especially for equalizers and draw bars.

For more information ask a Byers Engineer or write our Engineering Service Department for folder entitled "Byers Genuine Wrought Iron Billets."

A. M. Byers Company, Established 1864. Pittsburgh, Boston, New York Philadelphia, Washington, Chicago, St. Louis, Houston.

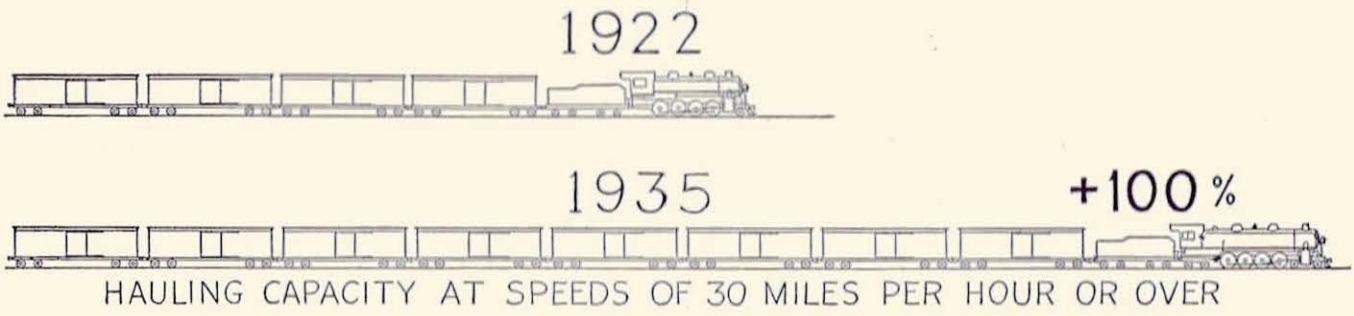
NRA

BYERS GENUINE WROUGHT IRON PRODUCTS

PIPE • WELDING FITTINGS • RIVETS • SPECIAL BENDING PIPE • O.D. TUBES
PLATES • SHEETS • CULVERTS • FORGING BILLETS • STRUCTURALS • BAR IRON

STANDARD of QUALITY for 71 YEARS • • • TODAY BETTER THAN EVER

WHAT WILL THE MODERN LOCOMOTIVE DO?



The chart shows two results of the use of modern locomotives replacing those built twelve or more years ago.

I. Hauling capacity at speeds of 30 miles per hour or over is doubled.

II. Fuel and water consumption per unit of work are reduced from 7% to 14% depending on the characteristics of the locomotives replaced.

Modern locomotives enhance the competitive position of the railroads and at the same time reduce repair and operating costs—all resulting in greater net operating income.

It takes Modern Locomotives to make money these days!

THE BALDWIN LOCOMOTIVE WORKS

PHILADELPHIA

Published weekly by Simmons-Boardman Publishing Company, 1309 Noble Street, Philadelphia, Pa. Entered as second class matter, January 4, 1933, at the Post Office at Philadelphia, Pa., under the Act of March 3, 1879.

MINER TRUCK SPRING SNUBBERS—UNEQUALED

IN PREVENTING VERTICAL OSCILLATION AND IN PROTECTING FREIGHT CARS AND LADING AGAINST DESTRUCTIVE BOUNCING

MINER SNUBBERS do their work well under all conditions of main line service—high speeds, out-of-round wheels and unyielding roadbeds. They prevent injury to lading located directly over the trucks as effectively as in the center of the car. They are the practical solution of the car stabilization problem because they do not require any change in the standard truck spring arrangement. They do not increase weight of car and their first cost is reasonable.

MINER SNUBBERS are an investment in economy that will bring sure and substantial returns.

W. H. MINER, INC., CHICAGO

G-R-S CAR RETARDERS

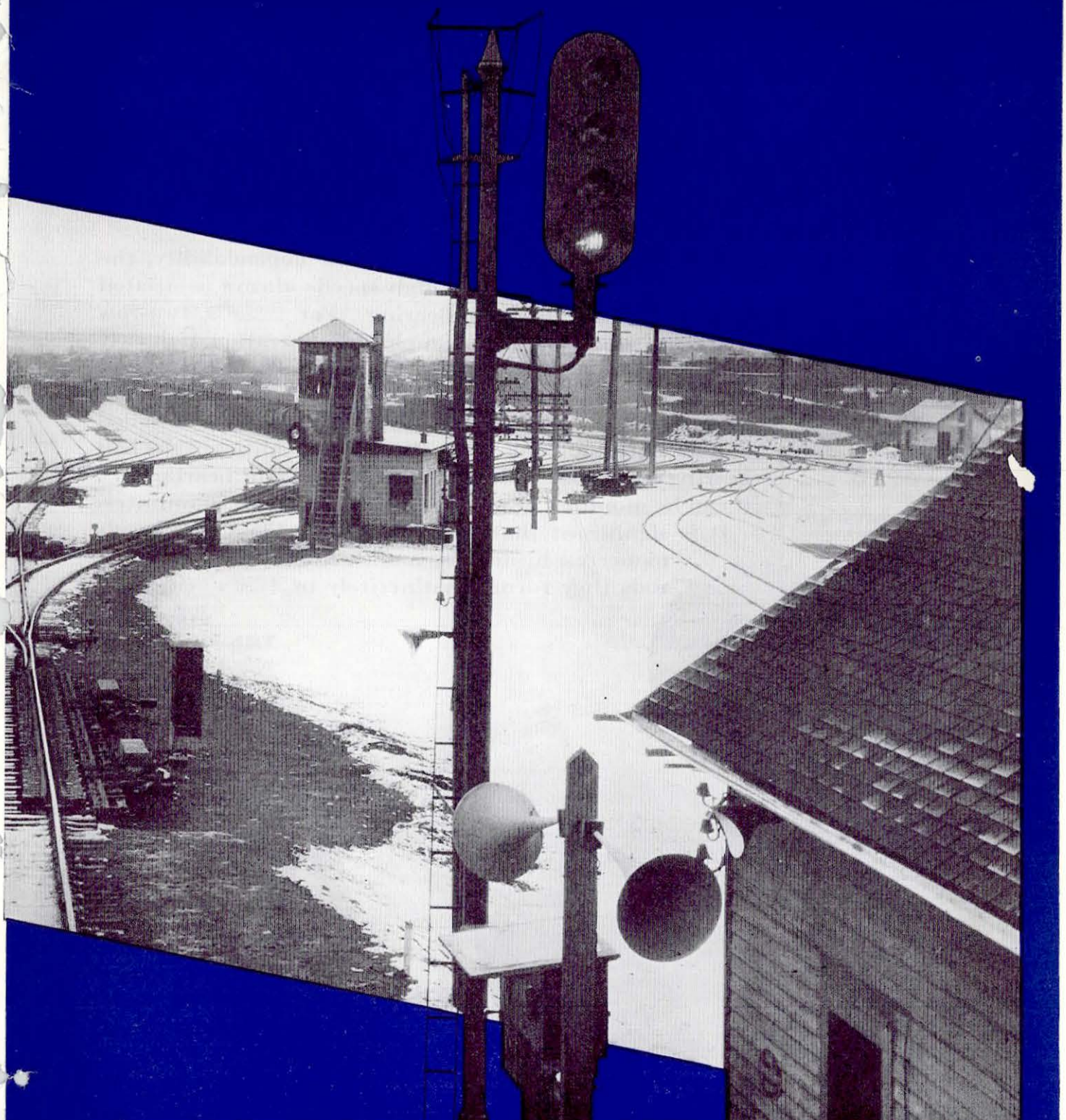
G-R-S Car Retarders facilitate and expedite yard operations **at Reduced Cost** because of—

- Reduced engine and crew hours.
- Elimination of flat switching in vicinity of yard.
- Retarder plant always available for maximum traffic.
- Reduction in damage to cars and lading.
- Reduction or elimination of pilferage.
- Elimination of personal injuries to car riders, switch tenders and others.

A. R. A., Signal Section, reports average return of 42.86 per cent on investment; also average savings of 27¾ cents per car handled.

Electric Operation Assures Reliable Power at Low Cost

REDUCE YARD COSTS



GENERAL RAILWAY SIGNAL COMPANY

ROCHESTER, N. Y.

New York Chicago St. Louis A-1259

Montreal London Paris Tokyo Madrid Melbourne Calcutta Buenos Aires

SKF

JOURNAL BEARINGS *for* LOCOMOTIVES

1 SKF *Journal Bearings on Tender applications are equipped with a tapered sleeve that permits the bearing to be removed in 30 minutes.*

2 *Constant lateral thrust of Trailing Trucks is absorbed in the rolling elements of the* SKF *Spherical Self-Aligning Bearing.*

3 SKF *Roller Bearings for Main and Side Rods on D. & H. locomotive, the first engine to use anti-friction bearings for rods and main driving axle.*

4 *The success of* SKF *Bearings on many auxiliary locomotives and boosters during the past 12 years has been a definite factor in promoting dependable driving axle applications.*

5 *The* SKF *Split Box on inboard Engine Trucks and Driving Axles is very desirable because of low maintenance.*

6 SKF *Journal Bearings were on the first railroad-owned passenger locomotive (N. Y. Central) anti-friction drivers, and today are on 178 N. Y. Central engine truck applications.*

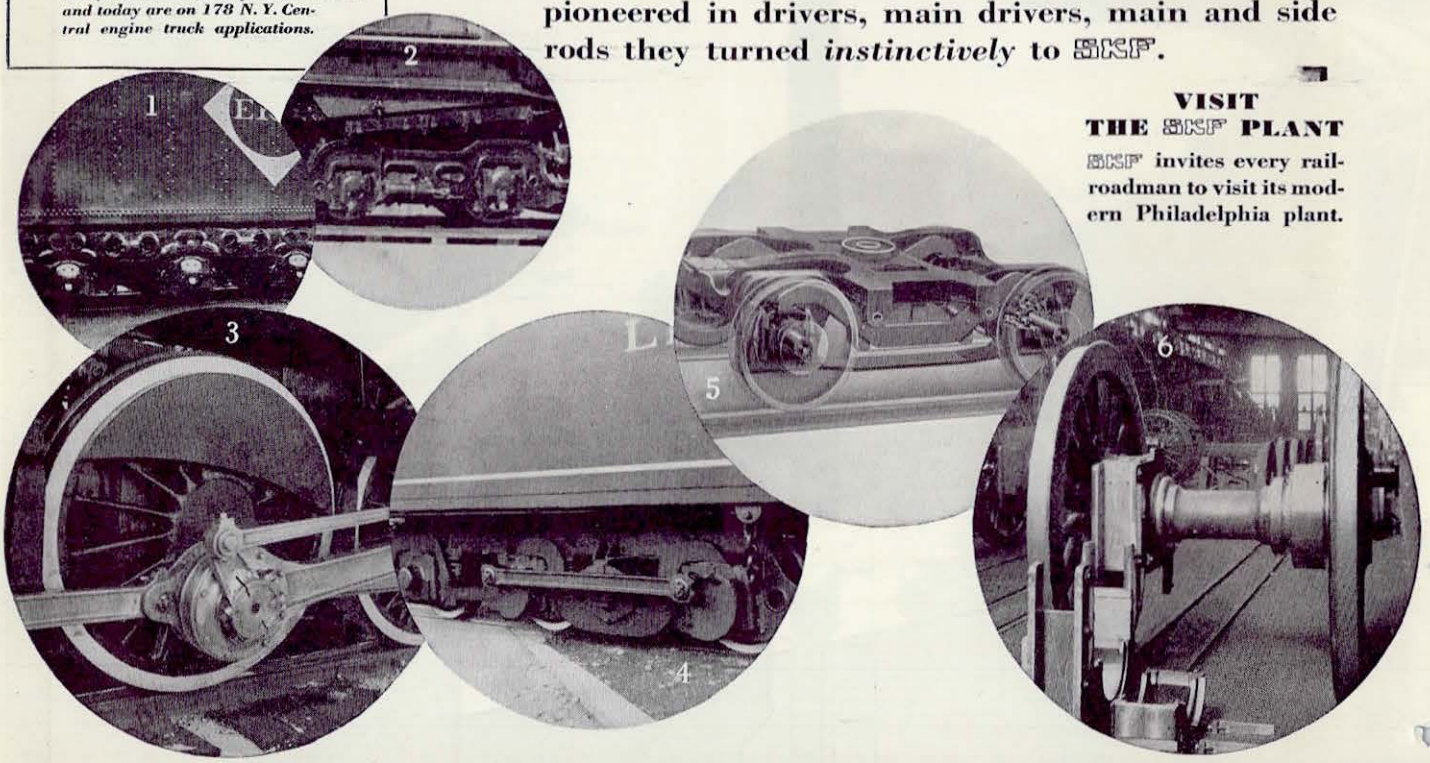
PROGRESS is made possible with the dependability, the low maintenance, and the high speeds *always* associated with the SKF Journal Bearing. For SKF's two-row roller design and split box couples free operation with easy accessibility and low *running* upkeep in driving axles and engine trucks, etc.

The SKF Journal Bearing is outstanding. It is designed and made to approach the anti-friction qualities of the ball bearing . . . it is made as well as is the ball bearing . . . it can be mounted or dismounted in less than 30 minutes.

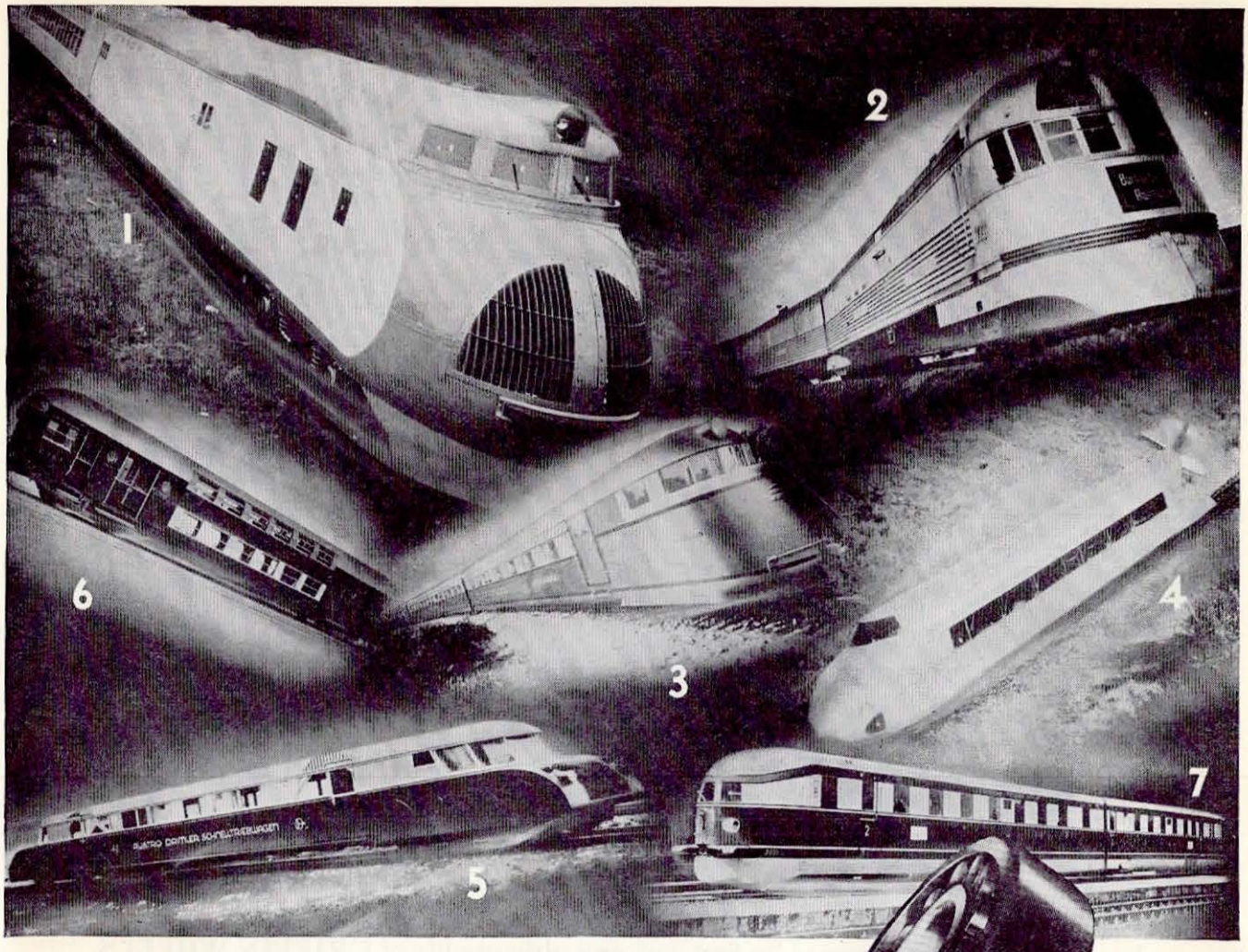
It is significant that when America's Class 1 railroads pioneered in drivers, main drivers, main and side rods they turned *instinctively* to SKF.

VISIT THE SKF PLANT

SKF invites every railroadman to visit its modern Philadelphia plant.



HERE'S THE JOURNAL BEARING OF THE RAILROADS OF THE WORLD



3359

for HIGH SPEED *Streamline* CARS

Modern transportation cries for speed . . . MORE SPEED! The greater the demand for speed, the greater the need for bearing dependability. So when the railroad engineer thinks in terms of speed, he thinks of SKF. For he *knows* SKF performance is a success.

He *knows* that SKF Bearings are designed and used for high speed equipment that requires bearing dependability. He *knows* the SKF Cylindrical Roller Bearing is used the world over for traction motors, while the SKF Spherical Roller Bearing is the logical choice for journals.

SKF engineers will be glad to help you solve *your* bearing problems. SKF INDUSTRIES, INC., Front St. & Erie Ave., Philadelphia, Pa.

1 *Union Pacific High Speed Passenger Train equipped throughout (journals and rotating electrical equipment) with SKF Bearings.*

2 *Burlington Route High Speed Train, the Zephyr (all rotating electrical equipment), SKF equipped.*

3 *The Autotram, to be built by Clark Equipment Company, and equipped throughout (journals and rotating electrical equipment) with SKF Bearings.*

4 *Famous Rail Zeppelin. 144 miles per hour. All journals SKF equipped.*

5 *Austro Daimler Railcar. All journals SKF equipped.*

6 *New French High Speed Passenger Coach. All journals SKF equipped.*

7 *The Flying Hamburger (all rotating electrical equipment) SKF equipped.*

Dutch State Railway. 1840 SKF Boxes for 40 three-car trains. (Not illustrated).

South Manchuria Railways "ASIA". Equipped with 324 SKF journal Boxes. Not illustrated.

Total number of SKF Boxes delivered to date to worldwide Steam and Electric Railway Services over 190,000

GRIFFIN CHILLED TREAD WHEELS

WHY 97% OF THE RAILROADS STANDARDIZE CHILLED TREAD WHEELS

1. **ECONOMY:** Governed by first cost and ultimate life of **GRIFFIN WHEELS.**
2. **GUARANTEE:** Which assures a minimum service for **GRIFFIN CHILLED TREAD WHEELS.**
3. **CONVERSION PRIVILEGE:** By which old **CHILLED TREAD WHEELS** can be returned in part payment for new wheels purchased, thus assuring the RAILROADS of a favorable market for disposing of old wheels.
4. **ACCESSIBILITY:** The accessibility of the **12 GRIFFIN PLANTS** in all sections of the country to the repair shops of the Railroads avoids the necessity of carrying large stocks of wheels and eliminates the expense and delay of long hauls.
5. **SAFETY:** The safety of the **GRIFFIN CHILLED TREAD WHEEL** is unquestioned, no other type or make of wheel has such a remarkable record of safety.

THE FOOD SUPPLY OF THE NATION IS CARRIED ON CHILLED TREAD WHEELS

GRIFFIN WHEEL COMPANY

410 NORTH MICHIGAN AVENUE **CHICAGO, ILLINOIS**

Plants

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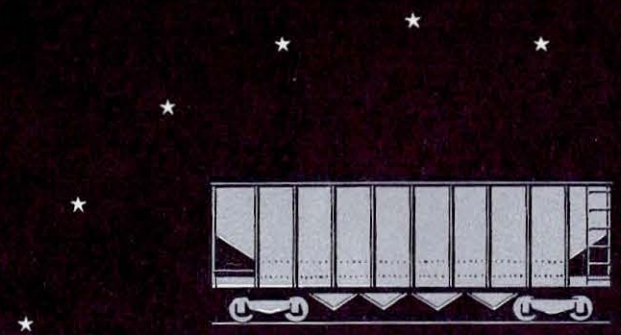
ALUMINUM IS RIGHT



BECAUSE LIGHTNESS IS INHERENT •

ALCOA

● The increasing recognition of the economic absurdity of excess weight of rolling stock is being paralleled by increasing recognition of the economic and engineering rightness of making the weight-saving with Alcoa Aluminum.

It is interesting to note in passing that new cars ordered in 1934, of the hopper type alone, will add, conservatively, something like 311,160,000 unnecessary ton-miles to the annual haulage costs of American railroads.

That costly excess could have been saved by designing with Alcoa Aluminum. The slightly higher original unit cost would have made possible an increase in revenue per car, and a decrease in empty hauling cost, which would pay a handsome return on the additional investment.

More than that, construction of Alcoa Aluminum gives assurance of longer life, and of safe and dependable operation. This assurance arises from two fundamental considerations.

First is the inherent resistance of Aluminum to the kinds of corrosion most prevalent in railroad operation. Second is the fact that, to save weight with Alcoa Aluminum you do not have to decrease the thickness of shapes and plates. For Nature made Aluminum light. That inherent characteristic necessitates no compromise with stiffness, no short cuts to lightness. The Aluminum car stands the gaff.

We shall be glad to discuss these economic and engineering considerations with you in more detail. Address, ALUMINUM COMPANY OF AMERICA, 1878 Gulf Building, Pittsburgh, Pa.

ALCOA ALUMINUM

NO LAWSUITS
------NO TIME LOST

AMERICAN RAILROAD FENCE
and
BANNER STEEL POSTS

WHETHER you are just beginning to use fence insurance against right-of-way trespassing or are replacing obsolete, broken, or weakened barriers—use American Railroad Fence and Banner Steel Line Posts for that long service that more than justifies your care in purchase. These products are giving satisfactory service on nearly all the leading railroads in the country. The use of American Railroad Fence and Banner Steel Posts is not only insurance against stock claims, but protection for life and property. Send for complete information on these products including National Expanding Anchor Dirt Set End and Corner Posts.

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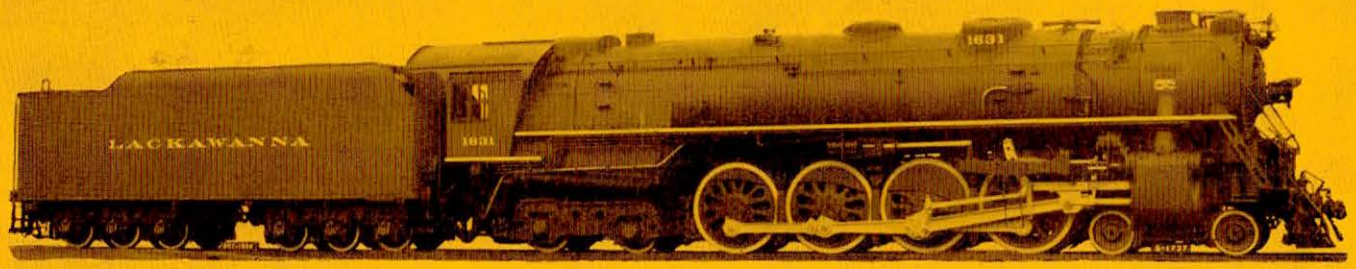
Offices in All Principal Cities

"See the interesting exhibit of the United States Steel Corporation Subsidiaries at the National Railway Appliance Association Exhibition at the Coliseum, Chicago."

United States Steel Corporation Subsidiary



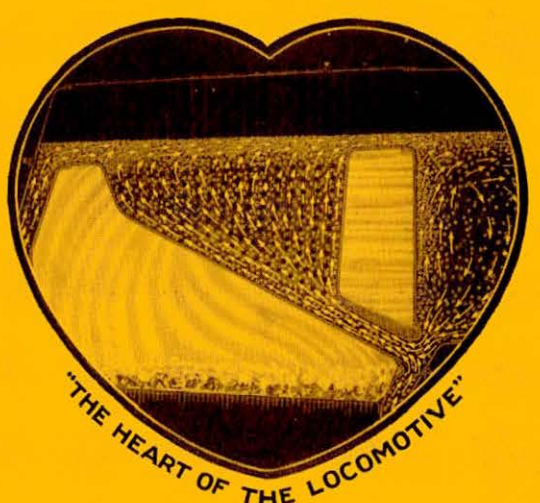
Including the order for 20 locomotives 4-8-4 type now being delivered, the Delaware, Lackawanna & Western R. R. Co. have 55 locomotives of this type. All are Syphon Equipped.

SYPHON EQUIPPED

Of Course

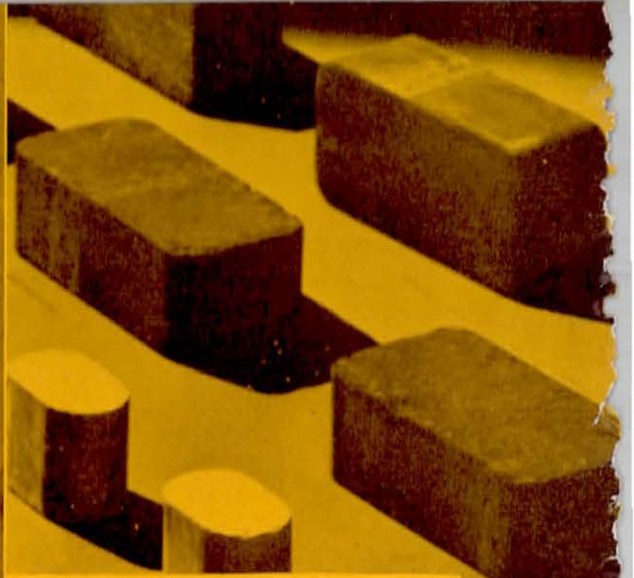
The new semi-streamlined locomotives 4-6-2 type for the Boston & Maine Railroad are equipped with three Syphons, adding 100 feet of most effective heating surface to the firebox.

Increased Heating Surface
Increased Circulation
Improved Performance
Reduced Maintenance
Fuel Economy
Safety in Case of Low Water



LOCOMOTIVE FIREBOX COMPANY

NEW YORK **CHICAGO** **MONTREAL**



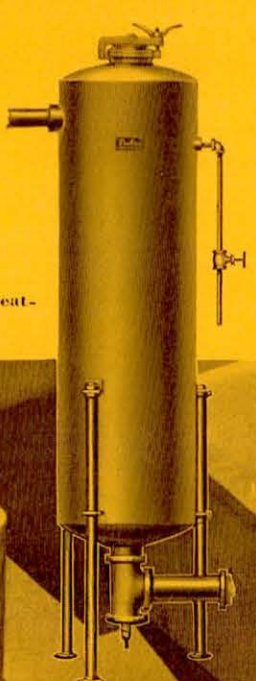
Compressed Brick Water Treatment

The brick form of Dearborn Water Treatment is supplied in a range of formulae to overcome scale formation, pitting and corrosion.

These bricks are made of dry materials under tremendous pressure and because of this have high effectiveness. They are completely soluble and are used either direct in locomotive tenders or in by-pass feeders.

Furnished in 1, 2½ and 5 lb. bricks, packed securely in cartons to insure their being received on the job in good condition.

Dearborn Water Treating Service is planned as the most efficient and economical in the world.



Dearborn By-Pass Treating Unit Type C

DEARBORN CHEMICAL COMPANY

310 S. MICHIGAN AVE.
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205 EAST 42nd ST.
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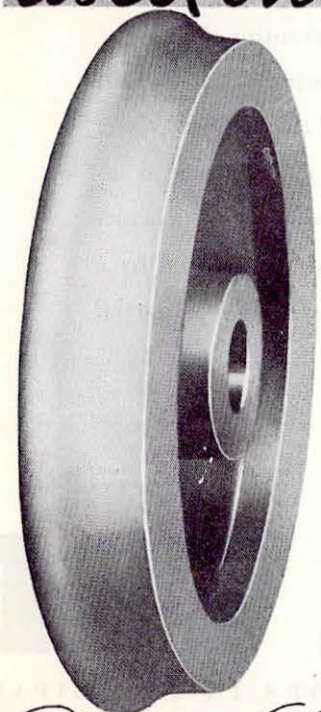
Dearborn

TRADE MARK REGISTERED

ILLINOIS WROUGHT STEEL WHEELS

See you at the NRAA show Spaces 41-51 and 60-69

used on the CHICAGO MILWAUKEE ST. PAUL AND PACIFIC *Luxury Coaches*

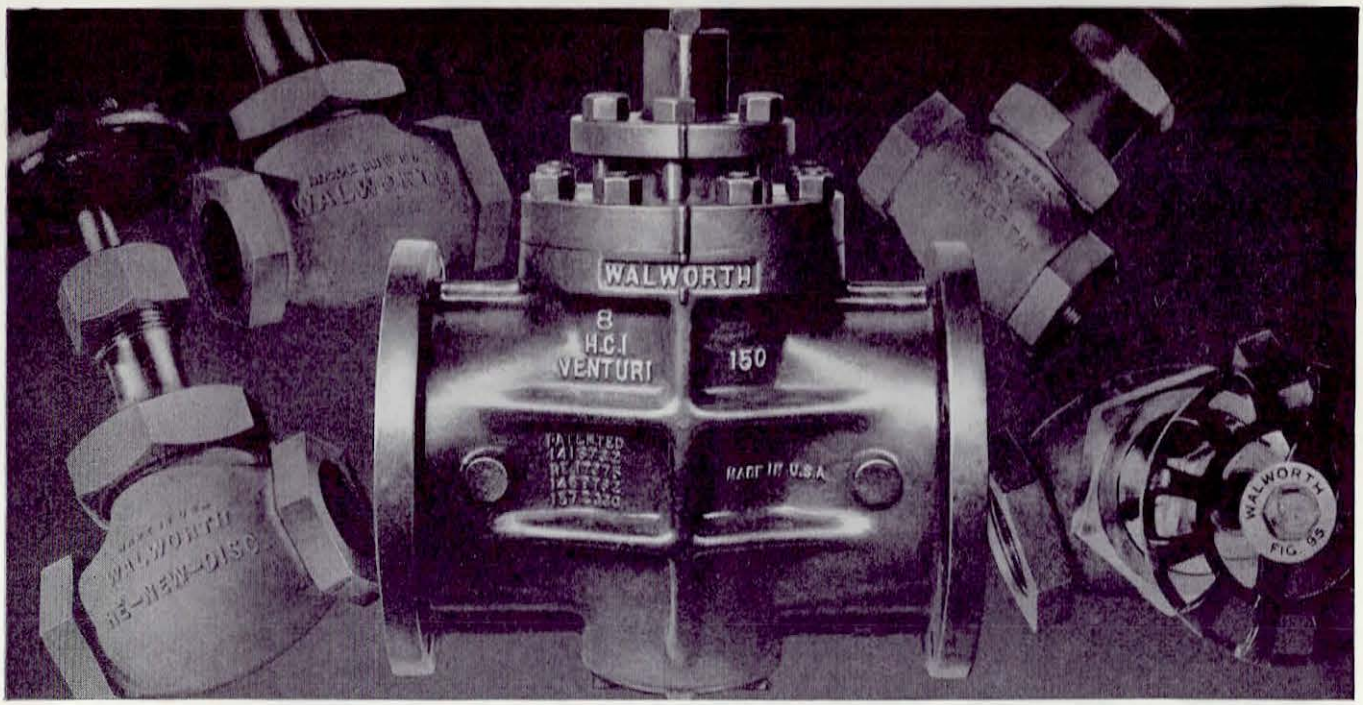


STRENGTH *FOR THE* NEW SERVICES

On many of the new high speed trains, Illinois Wrought Steel Wheels provide that added measure of dependability so necessary in maintaining exacting schedules. They're safe. They can stand severe braking. And they last longer.

ILLINOIS STEEL COMPANY
208 SOUTH LA SALLE STREET, CHICAGO, ILLINOIS
CARNEGIE STEEL COMPANY, PITTSBURGH

United States Steel USS *Corporation Subsidiaries*



CHOOSE Walworth Lubricated Plug Valves when needed . . . but . . .

Full direct flow port opening with one quarter turn — completely sealed, whether open or closed—positive tight shut off—freedom from attack by the fluids being handled — smooth turning — these advantages are yours with the Walworth Lubricated Plug Valves. They are available in all types for all pressure conditions.

But, they are not cure-alls. Economical valve performance demands a complete line, such as Walworth makes. If a Lubricated Plug Valve is the correct valve for a specific service, Walworth will recommend and supply the exact type. If one of the conventional types of gate or globe valves is suitable, Walworth makes and will recommend that specific valve.

Truly economical valve performance is assured by the Walworth Policy of the correct valve for the specific purpose — backed by a complete line of valves which makes impartial recommendations possible.

NRA
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WALWORTH

VALVES
FITTINGS
and TOOLS
Backed by
91 Years Service

WALWORTH COMPANY
60 EAST 42nd STREET, NEW YORK

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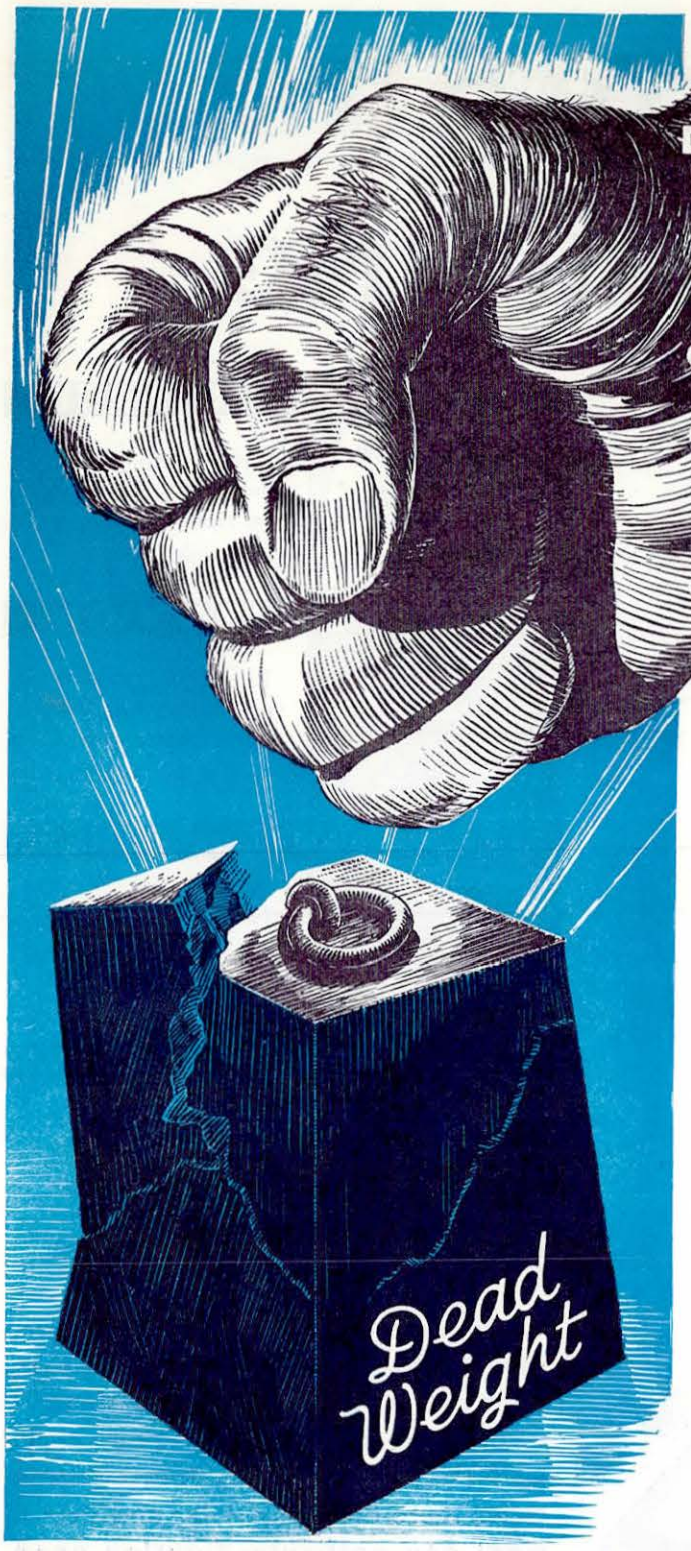
CITIES THROUGHOUT THE WORLD



TRANSPORTATION Deals a Mighty Blow for ECONOMY

USS HIGH TENSILE STEELS, far stronger, much more resistant to atmospheric corrosion, give transportation a powerful weapon with which to beat down the barriers to economical operation. Freight cars of great strength, designed efficiently with these High Tensile Steels, are built light so they can carry a larger pay load without added expense.

USS COR-TEN is a low chromium copper silicon steel, available in the same forms as mild steel. USS 18-8 is, of course, the superlative material in the weight-reduction series.

The atmospheric corrosion resistance of USS COR-TEN is based upon ACTUAL TESTS extending over a period of years in several different atmospheres. Our statements are based on this actual experience, rather than upon accelerated or laboratory tests.

USS High Tensile Steels are supplied in plates, shapes, bars, strip, sheets, rods, wire and wire products, pipe and tubular products. Literature and information sent upon request.

Address the Following Manufacturing Companies

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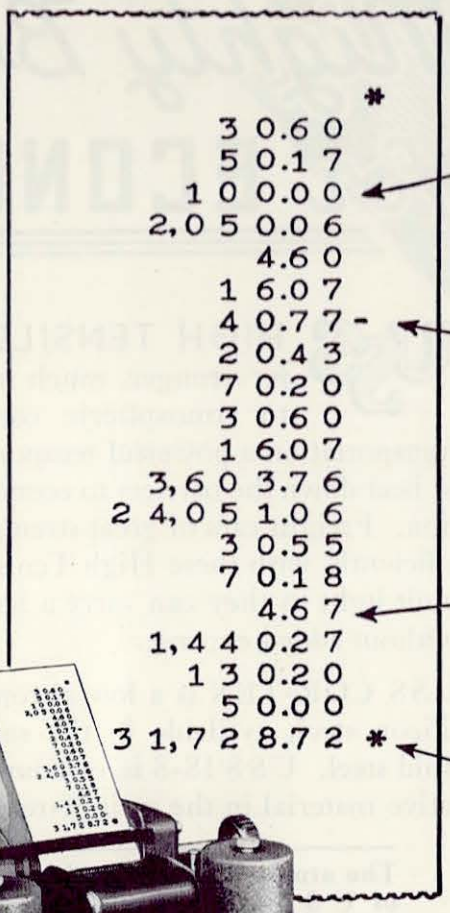
United States Steel Corporation Subsidiaries

USS HIGH TENSILE STEELS

Burroughs

FAST FIGURING



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Ciphers print automatically. There is no cipher key on a Burroughs.

FASTER SUBTRACTION

To subtract, touch the subtract bar. This makes subtraction as fast as addition.

SEVERAL KEYS AT ONCE

Two or more keys can be depressed at a single stroke.

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To take a total, depress the total key. At this single motion the machine operates and prints the total.

Try this new Burroughs. See how fast you can list, add and subtract amounts by using short cuts *POSSIBLE ONLY* on the standard visible keyboard. See how much of the work this new Burroughs does automatically. There are many styles and sizes to meet any particular figuring need. Prices are surprisingly low. Telephone the local Burroughs office for a demonstration, or write for free, descriptive folder.

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DETROIT, MICHIGAN

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The Railway Age is a member of the Associated Business Papers (A. B. P.) and of the Audit Bureau of Circulations (A. B. C.).

Subscriptions, including 52 regular weekly issues, payable in advance and postage free: United States and possessions, 1 year $6.00, 2 years $10.00; Canada, including duty, 1 year $8.00, 2 years $14.00; foreign countries, 1 year $8.00, 2 years $14.00.

Single copies, 25 cents each.

Railway Age

With which are incorporated the Railway Review, the Railroad Gazette and the Railway Age-Gazette. Name registered U. S. Patent Office

Vol. 98 March 2, 1935 No. 9

NRA U.S. CODE GRAPHIC ARTS INDUSTRY

In This Issue

The Railway Status and Outlook ..... Page 322

Ralph Budd, president of the Chicago, Burlington & Quincy, stresses the need for regulation of all transport agencies, points out how consolidation will permit economies and notes rapid technical advances, particularly in locomotives.

Normalizing Process Perfected for Rails 325

John Brunner, manager of the Department of Metallurgy and Inspection of the Illinois Steel Company, Chicago, outlines developments which offer promise of eliminating transverse fissures and other internal defects.

Factors Affecting the Cost of Locomotive Repairs 329

Hubert J. Titus, transportation engineer for the Franklin Railway Supply Company, New York, presents statistical evaluation of miles between shoppings, intensity of utilization, age and power in relation to locomotive maintenance expense.

EDITORIALS

Uniform Regulation Would Benefit Public and All Transport Agencies 319
The Problem of Terminal Co-ordination 320
Warning and Reassurance 321

GENERAL ARTICLES

The Railway Status and Outlook, by Ralph Budd 322
Normalizing Process Perfected for Rails, by John Brunner 325
Freight Car Loading 328
Factors Affecting the Cost of Locomotive Repairs, by Hubert J. Titus 329
Railroad Views of R. F. C. Chairman, by Jesse H. Jones 332
Hearings on Eastman Bills 334

NEWS 338

The Railway Age is indexed by the Industrial Arts Index and also by the Engineering Index Service

ALLOY STAYBOLTS WILL CUT DOWN REPLACEMENTS

Locomotives have outgrown the old staybolt materials.

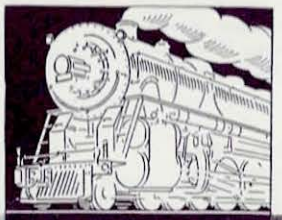
Higher pressures and bigger boilers coupled with modern methods of operation have brought the modern alloy staybolts of steel or iron.

Besides greater corrosion resistance and improved physical qualities, Republic's alloy staybolt materials work more easily. They drive up solidly without cracking.

That means fewer leaky bolts and less trouble at the roundhouse.

Many roads who have standardized on Republic alloy staybolt materials report locomotives running from shopping to shopping without a single leaky or broken bolt.

Use modern materials for staybolt repairs.



LOCOMOTIVE JACKET SHEETS

Among its many railroad specialties Republic makes steel sheets for locomotive jackets. They take a fine polish.

Republic Steel CORPORATION

CENTRAL ALLOY DIVISION, MASSILLON, OHIO

GENERAL OFFICES: YOUNGSTOWN, OHIO

RAILWAY AGE

Uniform Regulation Would Benefit Public and All Transport Agencies

Economic activity flourishes only when the prices of each important group of goods and services bear such a relation to those of other groups that each group finds a ready sale for all it can economically produce. Depressions result when the prices in any important group—as, for instance, products of agriculture—become abnormally low in comparison with other prices; then the income of producers in that group will be insufficient to enable them to make normal purchases from other producers. Thus, not only agriculture, but industries dependent upon agriculture as a market for their products, suffer from its lowered purchasing power. Similarly, if the prices of any important group of commodities are abnormally high, then producers of commodities lower-priced are forced to restrict their purchases in that group, and depression results from the maladjustment.

Discrimination Destroys Economic Balance

Natural economic laws, if their operation is not interfered with by political power, invariably work toward the restoration of price relationships which permit the maximum production and exchange of goods and services. Political power does, however, intervene and, when it does, it usually does not distribute its effects evenly. It favors one group of producers, leaving others unaided, and thus intensifies the inequalities which characterize all depressions—and the removal of which is absolutely essential to the restoration of prosperity.

A perfect example of government interference with the normal operation of economic laws is afforded in the protective tariff. The tariff was designed in the fancied interest of American manufacturers, to enable them to exact higher prices for their goods than they would get if exposed to foreign competition. The farmers, however, have to sell their surplus products abroad—to the very countries which the protective tariff deprived of an American market for their products. The result was that foreign countries, having no means of paying for our products except by offering their products in exchange, could no longer absorb our agricultural surplus. Farm prices fell to disastrous levels—and American industry lost a large part of its most important domestic market.

The present Administration has tried to correct this situation by establishing artificial restraints and subsidies in behalf of agriculture similar to those enjoyed by industry under the protective tariff. Now it may be argued (soundly, too, in our opinion) that the proper solution of this agriculture-industry relationship is to remove government interference from both of them. Be that as it may, the fact still remains that, if political protection and restraint is to be exercised by tariffs in behalf of industry, then the logic of the situation makes necessary the application of counter-balancing political measures in behalf of agriculture. This argument has been advanced repeatedly by the Secretary of Agriculture, and it is, in our opinion, unanswerable. Such measure of recovery as has occurred in agriculture, and in farm markets for the products of industry, has resulted largely from the restoration of some of the balance between agriculture and industrial prices which has followed political measures taken regarding the former to offset those in behalf of the latter.

Freedom Desirable, But Balance Is Indispensable

Balance is the heart of everything in economic life. In a completely free, competitive society, the balance develops naturally and automatically. When political power intervenes, however, usually with an immediately selfish interest to advance, the necessity for balance is usually lost sight of, with disastrous consequences, even to the interest in behalf of which the favoritism is exercised. As proof of this we need only observe that the lack of balance between agricultural and industrial prices, arising from political favoritism exercised in behalf of the latter, worked to the detriment of industry as well as agriculture. The partial restoration of balance between agricultural and industrial prices, by applying political measures to agriculture similar to those in industry, has brought about some improvement in farm incomes which, in turn, has improved the sales of industrial products to farmers. Balanced price relationships, however secured, are the keystone to normal economic activity.

This elementary principle has been recognized—and acted upon with highly favorable results—as regards the relationship between agriculture and industry. But chaotic lack of balance still persists in transportation—perpetuated by the same inequality in dispensing political favors which for so long a time kept agriculture in poverty and destroyed the farmers' purchasing

power. Restoration of the balance in transportation—by the equal distribution of political favors and political restraints among all the agencies—could not fail similarly to contribute to general business recovery. Furthermore, the recovery of general business which would follow an even distribution of political action in transportation, would benefit the favored transportation agencies more than sufficiently to offset their present loss of political favors.

It is contrary to the national economic welfare for business to be predatory, and to depend for its existence upon political favors not accorded to its competitors. There can be no health or lasting stability in a business which bases its policies and behavior upon such favors. Impartial students of transportation have long recognized this. Co-ordinator Eastman in his recent report favoring the regulation of interstate motor and water carriers based his recommendations on the need for such regulation in the public interest and that of these carriers themselves, rather than in that of the railroads. Similarly with regard to subsidies, he pointed out that great care must be exercised and that "all conditions which are unjust and capable of correction" should be corrected—this also, not for the selfish advantage of the railroads, but for the more efficient functioning of the transportation industry as a whole.

Elimination of Colossal Competitive Wastes an Advantage to Everyone

It cannot be denied by any competent observer that the transportation machine is in a chaotic condition and that this condition is resulting in colossal waste of the national income. Some of this waste is being paid for by users of transportation in the rates they have to pay. Some of it is being paid for by the taxpayers in the form of subsidies to favored agencies. Some of it is being paid by transportation employees by long hours of work at low pay. Some of it is being paid—in low earnings—by the owners of transportation companies. There may be some disagreement as to who is bearing the bulk of the burden of the waste, but none can deny that the waste exists or that its elimination would add greatly to the national income.

The *Railway Age* is a railroad publication, and is of course greatly concerned with the welfare of the railroad industry. But our point of view is primarily social and national. We do not believe that the railroad business, or any other business, will in the long run prosper by receiving favors from the government which have the effect of subtracting from the sum total of the national income. The unequal distribution of political favors and restraints in transportation *is* undeniably subtracting from the national income and we are, in consequence, opposed to this inequality.

The real issue in the transportation business today is not primarily the favors enjoyed by this agency, or that agency, but rather the elimination of the unnecessary competitive wastes of the industry so that those engaged in it can make a little money while lowering the total cost (in rates and taxes) of transportation service to American industry and agriculture. The legislation recommended by Co-ordinator Eastman now pending in Congress to equalize the distribution of political power in the regulation of all forms of transportation will go a long way toward restoring economic balance and curbing competitive excesses in transportation. The restoration of this balance would promote the prosperity, not only of all legitimate agencies of transportation, but would stimulate national recovery as well. The Co-ordinator's regulatory program ought to be supported, therefore, not only by the disinterested public, but by every intelligently selfish interest in the transportation industry.

The Problem of Terminal Co-ordination

The report of the Regional Director of Co-ordination, issued by the Federal Co-ordinator last week and published in the *Railway Age* of February 23, is a document well worth studying. It is by no means complete, and it deals at length with only one terminal, that at Chicago, yet it points out a basic difficulty in terminal co-ordination, in terminal operating efficiency, that should not be overlooked.

In the solution of practically every terminal problem in the country, efficiency has been handicapped, to a greater or less extent, by competitive rivalries and by an intense, and oftentimes short-sighted loyalty of the officers in charge to the railways that employ them. In the Chicago terminal, for example, it would not be difficult to point out numerous instances of the movement of cars via one belt railway when operating efficiency should have dictated the employment of another.

All of these things have helped keep terminal costs higher than they should be, with their resulting higher rates, and have thereby driven business away from the railways. The report points out a specific instance of this in Chicago, where the contractors for the new post office, built directly over railroad tracks, turned to trucks for the transportation of between four and five thousand carloads of sand, gravel and crushed stone used in its construction.

In so far as the co-ordinator points out these inefficiencies and discrepancies, insofar as they are eliminated, even by the force he threatens in the preface of the report, Mr. Eastman will be doing a constructive job for the railways in spite of themselves. Petty jealousies have no part in the railway picture, particularly at this time when so many railways are fighting for their very existence.

There are parts of the report, however, which warranted more careful analysis before it was released for publication, and certain statements are made that are capable of entirely misleading interpretations. For ex-

ample, without further explanation, the report in question says:

"Our check indicated for the two-day test period that even the through traffic via the Chicago gateway, instead of all passing over switching lines around the city, was, to the extent of about 40 per cent, taken into the downtown area over the various lines and then moved back through the different switching lines to the outer belts, where it was delivered to the outbound lines."

The inference to be drawn from this unadorned statement is that an operating condition exists that is extremely inefficient and could be corrected quite easily by operating officers through the simple expedient of not bringing these "through" cars into the downtown area. Actually, most, if not all of these cars were destined to receivers in the downtown area and then, under the reconsignment privilege, forwarded to some other destination. Whether cars that are permitted by the shippers to reach their place of business before being reconsigned are to be considered as "through" cars is a moot question.

In any event, the report should have made it clear that this cross-haul movement was not made because of any lack of efficiency in operation, since, with cars billed to Chicago receivers in the downtown area, on which no reconsigning orders had yet been issued, operating officers had no choice but to handle them to their bill of lading destinations. If, as seems likely, the report was questioning the advisability of permitting such flexible reconsigning privileges, if it is the co-ordinator's idea to limit shippers in this respect, it becomes a matter of general policy and not of operating efficiency, and the report might well have so stated.

Again, the report criticizes the running of switch engines with one or two cars for long distances about the terminal, involving, in some cases, the return of the engine light. Much has been done at many terminals to avoid running engines light, and much remains to be done in this connection. However, a blanket condemnation of running switch engines to and fro in a terminal with one or two cars is not the answer to the question, nor does it tell the whole story. Not a little of the movement specifically complained of in this report consists of loaded stock cars. Manifestly, it is wasteful and expensive to run an engine five or six miles with one or two cars, instead of waiting until a sufficient number of cars can be consolidated for a more economical switching movement. On the other hand, it is still more expensive to hold a car of stock over the 36-hour limit and pay a fine of $100. This is a condition that neither the railways nor the co-ordinator can correct, as it is covered by a federal law that seems to have a permanent place in the statute books.

Another reason for these one and two-car switching movements is the matter of delay to perishable freight. When perishables are delayed beyond the scheduled times, claims are almost automatically filed to cover such delays, amounting, in many cases, to far more than the cost of hauling one or two cars seven or eight miles. In the report this is apparently criticized as an operating inefficiency, whereas, under present conditions, it actually saves money. If it is the co-ordinator's desire to eliminate payment of delayed claims on perishable freight, this also should be clearly stated in the report. These illustrations, which might be multiplied, shed light on what appear at first glance to be entirely unwarranted inefficiencies, but which, in reality, arise from relations with shippers and the service they demand.

With keen competition of every sort to be faced on every hand, the student of transportation affairs cannot help but agree with the report that it is time for less rugged individualism on the part of the railways and more co-operation for mutual advantage and to meet such competition on both a cost and a service basis. Especially in view of the plight in which the railways now find themselves, they should receive every suggestion for the conservation of their resources with a sympathetic attitude, searching for all possible help in the solution of their problems. Such an attitude will undoubtedly reveal merit in numerous suggestions, even though there may be disagreement with the major premise. In this light, the progress report of the terminal co-ordinator constitutes a constructive service to the railways and presents food for thought and action on their part.

Warning and Reassurance

Few will disagree with Henry Bruere's recent warning that the railroads must justify Co-ordinator Eastman's verdict against government ownership by what is done within the next year or two. Mr. Bruere, who is president of the Bowery Savings Bank of New York, the country's largest institution of its kind, is one of the railroad industry's best friends and ablest advocates in the financial world. He embodied the foregoing challenge in an address before the Traffic Club of New York, but expressed no misgiving about its being met successfully if (among other things such as the enactment of the Co-ordinator's transport regulation program) the Association of American Railroads functioned effectively.

It is therefore gratifying to report that even before Mr. Bruere's address had been delivered on February 15, reassurances in connection with the latter point had come from the February 14 address of President Pelley of the A.A.R. before the Washington, D. C., Transportation Club. There Mr. Pelley, while stressing the need for proceeding slowly at the outset, nevertheless expressed his firm conviction that the organization which he heads "is going to do for this important industry everything that can be done for the industry within the industry."

The Railway Status and Outlook*

Regulation of all transport urgently needed—Consolidation will permit many economies—Technological advances rapid, particularly in locomotives

By Ralph Budd

President, Chicago, Burlington & Quincy

THE public should withhold judgment upon the value and practicability of various changes in railroad operations, which have been suggested as possible opportunities for large savings, until there has been a thorough consideration and exploration of them. This is said with no thought of criticising the Co-ordinator and his staff, but rather to avoid expectations which may not be fulfilled. The railroads have been operating for many years, have had many able men in their employ, and have gone into literally thousands of co-operative arrangements at terminals, etc., in an effort to effect economies. I am far from saying that railroad operation cannot be improved very materially, as is being done steadily, but the opportunities are more limited than is generally realized and usually arise as a result of improvements in the efficiency of locomotives, developments in metal alloys and similar discoveries in science and industry.

A peculiarity about the exceptionally heavy railway traffic during the few years ending in 1929 which is of special importance was that it reflected a large amount of business that was incident to the rapid building and improving of thousands of miles of highways and the manufacture of millions of motor vehicles to operate upon those highways. What was happening was that the railways were being employed in the creation of new and powerful rivals which, since coming into being, have been handling a substantial part of the business which formerly was handled by the railways themselves. The improved highway system of 920,000 miles and about 24,000,000 vehicles which operate upon these highways constitute an entirely new form of overland transportation and have converted the highways to a large extent into competitors, whereas formerly they were complementary to the railways and served as a feeder system.

Must Not Stand in the Way of Progress

We must not stand in the way of progress, but, from the standpoints of the shipper and the investor in railroad securities as well as employees and managements, the creation of a new system of overland transportation in which there has been invested since the beginning of the century thirty-five to forty billions of dollars or more is a matter of first importance. We all know that, instead of handling practically the entire volume of traffic which formerly moved, the railroads will have to be content with a portion of the total in the future; just what proportion is not now determinable. The total transporation by all agencies of transportation will be much larger than it ever was before the day of improved roads and automobiles because they have created much new travel and traffic. As highway vehicles can provide certain kinds of transportation in a more effective way than railways, so there are other types of transportation service that the railways can provide much better than the highways. Both are needed and both will be maintained, but it should not be forgotten that having two such complete systems has doubled the transportation bill of the country.

From the public standpoint the need for regulation of trucks is by no means restricted to the idea of giving the railroads a more nearly equal opportunity in competition. Equally important is the guarantee that all shippers shall have equal rates and service from the common carrier trucks. It is the same necessity, that of insuring against discrimination, which brought about the regulation of railroads by the Interstate Commerce Commission in 1887. The necessity clearly indicates the importance of including not only highways but coastwise ships, inland waterways and pipe lines, and perhaps airways, in a comprehensive plan of regulation, preferably under the same authorities, the Interstate Commerce Commission for interstate traffic and the state commissions for that which moves intrastate.

Some Highway Operators Want Regulation

The regulation and taxation of commercial highway carriers have been much discussed over a period of several years. Highway operators insist that they are regulated in many respects and that they pay their full share of taxes. Most, if not all, of the responsible operators of buses desire more complete regulation, especially as respects rates and the franchises or certificates which give them the right to operate—that is, they want protection from so-called "cut-throat" and "fair weather" competitors whose methods tend to break down the rate structure and destroy revenues.

Within the group which makes up the trucking organizations, including the manufacturers and operators, there are quite divergent views about regulation. Some of them advocate it, while others are bitterly opposed. Quite obviously, it is much more difficult to regulate trucks than buses, first because there are so many more trucks, and second because trucks are used in so many ways by so many types of owners. Some of these, such as farmers' and delivery trucks, to mention only two, are especially difficult to regulate. They handle a great deal of other freight, but their principal business is hauling owner's goods.

Truck Regulation No Simple Problem

I have long felt that one of the greatest fallacies in most discussions of truck regulation is the assumption that the problem is a simple one and easy of solution, and that the railway problem would be solved if laws were passed which would sufficiently restrict the use of

* From an address before the Business and Professional Men's group of the University of Cincinnati, on Feb. 1.

trucks and buses. Another fallacy is the apparent belief that buses are responsible chiefly for the railways' loss of passenger travel and that eliminating buses would restore that lost business to the railways. My feeling is that regulation of trucks and buses, so far as that is practicable, is certain to come, and should come, but that a large volume of freight and passenger traffic will nevertheless continue to be handled by motor vehicles on the highways.

One of the constructive provisions of the Transportation Act of 1920 is that before any new railway construction is undertaken the project shall be presented in detail to the Interstate Commerce Commission and an order obtained stating that such construction is required by public convenience and necessity. It would seem only fair to the railroads and other established carriers, and also to be a reasonable protection of public funds in the interest of the taxpayers, that waterway and highway developments should be subjected to the same scrutiny and obtain the same kind of approval before expenditures are made upon them.

These investigations should go to the extent of determining the kind of improvement, if any, that is justified. If a certain highway requires additional construction cost because it is to be used by heavy trucks and buses, that additional cost should be determined as accurately as possible and the added cost assessed so far as possible against the users on whose account it is incurred. In the case of waterway improvement the traffic should justify the expenditure and the charges for handling freight by water should be sufficient to defray the entire cost of transportation.

Smaller Number of Systems Would Be Beneficial

Competition between railroads has been and still is one of the basic features of public policy towards the carriers. Until quite recently the theory seemed to be "the more competition the better." That was because the railways had, or were assumed to have, a practical monopoly on overland transportation. Now that they have plenty of rivals, it is become recognized that too much competition between themselves may be undesirable and injurious to the public interest.

There are 149 Class I roads and about 700 other railway companies operating in the United States, excluding very small properties which do not send completed reports to the Interstate Commerce Commission. The management of each of them, of course, is bound to conduct the affairs of each company in its best interest. This means unavoidably that at most points of importance there are many roads competing for the same business and between important points all over the United States there is offered the choice of a multitude of routes. With the decline in patronage because of the business depression and the further loss of traffic to the highway system, the amount of business left on some routes is very light and the struggle for "the famine loaf" doubtless has resulted in providing service that is unnecessarily fast and quite expensive on account of the speed and consequently the light tonnage trains. But, in the aggregate, the wastefulness of these competitive practices, in my opinion, has been overstated and, if it were the price the public must pay in order to obtain and enjoy the benefits of individual initiative, I believe it would be worth the cost.

The difficulty, as I see it, is not with the individual managements who are actuated by what they regard as the necessary and proper activities in their own behalf, but is due to the situation which has grown out of a long period of enforced competition with virtual prohibition of consolidation. The great public advantages of private ownership and operation, which in my opinion save many times the waste incident to such competition as exists, and the benefits of competitive service can both be preserved by removing the causes of the obvious evils of over-competition. Most of the evils would cease automatically if a relatively small number of systems should comprise all the railways of the United States.

Mergers Would Simplify Regulation and Administration

The use of the best routes, considering not only the characteristics of the lines between termini, but the accessibility of transportation terminals to industries, freight houses, team-tracks and other points of ultimate destination and origin, would follow as a matter of normal administration. Many miles of branch lines, possibly 20,000 to 30,000, would be eliminated. It is difficult for railways to abandon these with the present large number of companies. The number of through routes would be reduced and only the most direct and efficient ones in each system would be used for through traffic. Competition would be as keen as ever at important points, but would be between a smaller number of strong companies, all able and willing to give good service, instead of many weaker lines all made weaker by the excessive number of competitors. The service to the public actually would be improved. Even local stations would gain on account of the greater strength of the railroads serving them. Regulation as well as administration would be simplified because there would be only a small number of companies to deal with.

Theoretically at least, the public policy toward railway consolidation has been favorable for the past 15 years since it was so expressed in the Transportation Act of 1920. Very little actual progress has been made, however, toward reducing the number of competing carriers through consolidation or otherwise. It may well be felt that this failure to make any progress indicates that little, if anything more can be expected in the future in the way of corporate amalgamations. There is another way in which it seems to me that the benefits of unified operations might be brought about and that is by the organization of a comparatively small number of railway operating companies, each of which would take over several existing railway properties for operation. The owning corporations would be perpetuated but their physical properties would be leased to the operating companies and the advantages and economies which would result from unified operation would be reflected to the owners in their fair proportions of an aggregate net railway operating income which would be greater than the total of the several companies when operated separately. In view of the many difficulties which have been found to lie in the way of corporate consolidations this plan of organizing a small number of regional operating companies to handle all the railways of the country seems to be well worth giving serious consideration.

Railways Not Decadent

One frequently hears or reads the assertion that the railway system and management are both decadent; that no improvments in travel and transportation have been inaugurated in the past 30 years. Probably the more spectacular growth and development of automobiles and airplanes has given rise to these statements.

It is true that the standard gage of track has remained at 4 ft. 8½ in. and that the outside dimensions of cars and locomotives have not changed very much except in length, because of the restrictions in horizontal and vertical clearances which necessitate keeping within certain definite limits. Track construction has basically

continued to be of steel rails on wooden ties with crushed rock or gravel ballast. On the main lines of all railways track standards have been improved continuously. These changes are gradual, however, and escape the attention of the general public.

Motive Power and Equipment Developments

When we come to motive power and equipment, a different situation obtains. Changes have been so great and so striking that they have caught the public eye. Steam locomotives have been improved so radically since the World War that the newest types of freight locomotives are capable of producing approximately twice as many ton miles of freight transportation over a given piece of track as the older types could produce with the same amount of fuel. They are also much more dependable from the standpoint of running long distances between stops on account of the more perfect mechanism and the larger tenders with which they are provided. Of course, they still burn either coal or oil, and they still use steam made from evaporating water in the boiler, but the fuel is much more efficiently handled in the better fire boxes and the steam is used more effectively at higher pressures. The net results are so satisfactory that there is no question but that immediately following a revival of business and earnings large numbers of new steam locomotives can be justified on the basis of savings which they will make in better performance in the way of speed, reduced fuel cost, longer runs between stops, dependability and total engine miles per day.

In the case of cars, both freight and passenger, railway managements always have striven for the largest practicable pay load and the best possible relations between the amount of pay load and the weight of the car. The increased safety of all cars and the travel comforts which are provided have caused great increases in the weight of car per passenger.

In the case of freight cars, although they have been made very heavy in order to stand service in long and heavy trains, the ratio of empty car weight to pay load has been improving of late. Great and rapid advances have been made possible in these respects within the recent past by the development of stronger materials as the result of research and progress in metallurgy. Already it is possible to reduce the weight of cars approximately one-third without sacrificing anything in strength or capacity. The problem, of course, is one of balancing the higher first cost against the increased operating efficiency.

Large Amount of Research Undertaken

The railways have done a large amount of scientific research. It is fair to say, however, that we all owe a great deal to the advances that have been made in metallurgy and other sciences by the automotive and æronautical industries. Among the important ideas which have been borrowed from these industries and adapted to railroading is the internal combustion engine, which has been used by railroads for many years. The most common form is the gas-electric car for use in passenger service.

Some of the stronger alloys have within the last two years made possible the building of Diesel engines of light enough weight per horsepower to make them suitable for passenger trains, especially when lightweight engines are used with a lightweight trailing load, which is accomplished by building the front-end of the forward car frame and engine bed as well as the balance of the cars with high tensile strength or lightweight material. It is unwise to predict what the future of this development may be, but I have no hesitancy in saying that the recent accomplishments promise much in the way of economical operation of lightweight trains at high speed. At present these Diesel electric locomotives seem to be especially adapted to such trains, but it seems doubtful whether they are more economical than steam locomotives for the heavy trains.

Outlook By No Means Hopeless

Geared to mass production in order to produce low cost transportation, railway revenues have declined because of the general depression in business, the loss of three-fourths of their passenger business, and the increasing competition from agencies of transportation that have sprung up in recent years. Labor costs have not been reduced in line with costs of other things and have handicapped the railways in meeting competition by lowering rates. Payrolls now constitute 59 per cent of all operating expense and absorb more than 43 per cent of all operating revenues as compared with 38 per cent in 1916.

Competitors of the railways should be regulated in the same way and preferably by the same authorities that regulate the railways. Projects like waterways and highways which are undertaken at public expense should undergo the same scrutiny that railway construction does at the hands of the same authorities, namely the Interstate Commerce Commission, and should be approved only when they are economically justified.

Fixed charges, i.e., interest on debt, may with advantage be reduced but generally this should be through refunding at low interest rates rather than reduction of debt, unless the amount and value of the plant are reduced. There are, of course, some instances where too much debt has been incurred. The plan of using bonds for a prudent proportion of railroad financing should be continued, but in addition to keeping the amount within reasonable limitations and consequently enjoying low interest rates, mortgages should provide that bonds may be called after a few years and should be free from such arbitrary provisions as have proved embarrassing in the past.

As increasing speed is a recognized trend, on both railway and highway, the Federal Government should undertake a national program of grade crossing elimination and protection. Now is a most opportune time when public works projects are regarded as necessary for relief of unemployment.

The outlook for the railroads is by no means hopeless. They are quietly working out their destiny, day by day, retiring old equipment, adding new, and generally improving methods of operation. The changes would be accelerated greatly if revenues were greater, but are occurring even under present conditions.

The railroad problem simmers down to one of money. We must first provide credit and funds to enable the railroads to operate until the time when returning business will restore their earnings. We must also permit the railroads to earn sufficient money to enable them to purchase new materials and equipment to increase their depreciated reserves so as to retire equipment and structures more rapidly than in the past, to lay aside some liquid reserves to tide them over future periods of depression, and to pay moderate dividends to those who invest in railroad stocks so that it will again be possible to finance railroad operation in part through the sale of stock and not depend for additional funds chiefly upon bonds. Many details enter into this program, but they simmer down to the adoption of legislative and administrative policies which will afford the railroads a fair opportunity to serve the public for reasonable and compensatory charges, and refrain from adopting legislation which will cripple or destroy private ownership and operation.

Normalizing Process Perfected for Rails

Offers promise of eliminating transverse fissures and other internal defects—Increases resistance to batter

By John Brunner

Manager, Department of Metallurgy and Inspection, Illinois Steel Company, Chicago

THROUGH intensive research and experimentation, the Illinois Steel Company has perfected a new process for the manufacture of rail, known as normalizing, which produces rails with greater ductility and resistance to impact, and also with greater resistance to wear and to end batter. More important, it is believed to eliminate those conditions which give rise to transverse fissures and other interior defects.

This process is the result of more than twenty-five years of research on the part of the rail-producing subsidiaries of the United States Steel Corporation. In this research the quality of the rail steels has been studied and investigations and experiments have been undertaken to determine ways and means for further improvement. These research activities have been carried on in the laboratories and at the rail mills of the Illinois Steel Company under the supervision of the writer and A. D. Beers, in consultation with the metallurgical staffs of the other rail producing subsidiaries, and with the personnel of the research laboratories, of the United States Steel Corporation.

Finding Why Rails Break

To give a clearer understanding of the process that has been developed and of its effect on the rails produced, it is necessary to review the investigations that were made and particularly the information that was obtained from them. One of the first of these investigations was made to determine why rails break more frequently at low than at high temperatures. Special equipment was devised to produce the desired temperatures, and impact tests were made on full-sized specimens of rail, at various temperatures between 45 deg. below and 60 deg. above zero. These tests showed conclusively that the impact resistance of rails decreases rapidly with the temperature of the steel within the range covered by these tests, this being particularly noticeable in rails having hardening properties such as are required by current specifications.

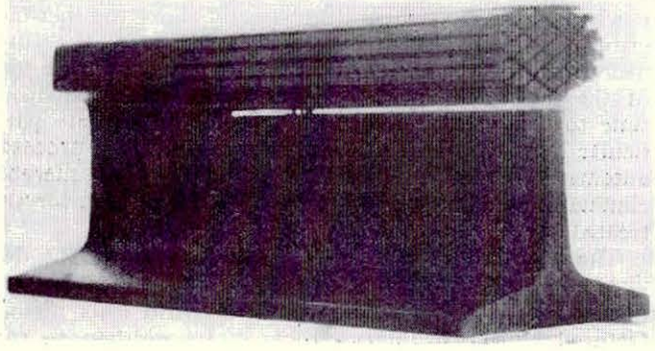


Fig. 1—Method of Sawing Rails to Determine Internal Stresses

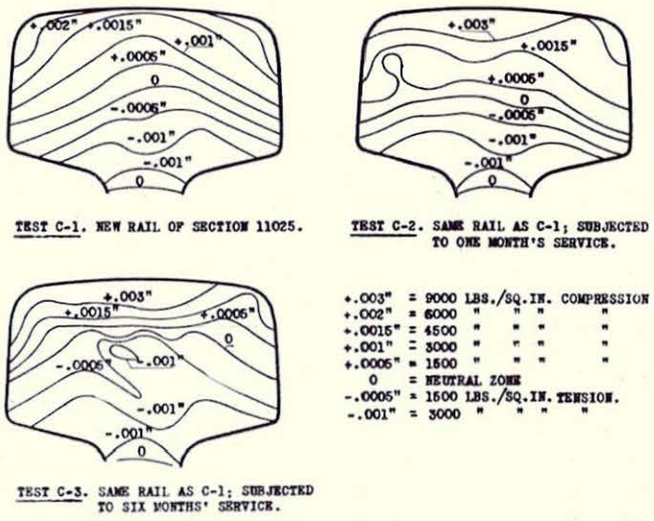

+.002" +.0015" +.001" +.0005" 0 -.0005" -.001" -.001" 0
TEST C-1. NEW RAIL OF SECTION 11025.
+.003" +.0015" +.0005" 0 -.0005" -.001" -.001" 0
TEST C-2. SAME RAIL AS C-1; SUBJECTED TO ONE MONTH'S SERVICE.
+.003" +.0015" +.0005" 0 -.0005" -.001" -.001" -.001" 0
TEST C-3. SAME RAIL AS C-1; SUBJECTED TO SIX MONTHS' SERVICE.
+.003" = 9000 LBS./SQ.IN. COMPRESSION
+.002" = 6000 " " " "
+.0015" = 4500 " " " "
+.001" = 3000 " " " "
+.0005" = 1500 " " " "
0 = NEUTRAL ZONE
-.0005" = 1500 LBS./SQ.IN. TENSION.
-.001" = 3000 " " " "

Fig. 2—Magnitude and Distribution of Stresses in a Rail Cooled on the Hot Bed, When New and After One and Six Months of Service

About the time that the foregoing investigation, which required 2½ years to complete, was finished, transverse fissures were beginning to be a problem and attention was turned to this defect and its causes. It was soon found that the so-called transverse fissure, or interior progressive fracture, could be produced in about the middle of the head in new rails, by repeated stresses approaching the yield strength of the steel. It was also found that their exact location depended on the place of application of the load on the running surface of the rail. Not the least important of the information obtained in these investigations, and which finally pointed the way to the development of the normalizing process, was that both the fractures at low temperature and the fatigue failures resulting from repeated stresses, invariably started in the coarser grain structure in the interior of the head of the rail and spread to the surface.

Studies of Thermal Ruptures Made During War

Further investigation was interrupted by the World War but was resumed immediately after it closed. During this period, however, rapid strides were made in the thermal treatment of steel in connection with ordnance and munition materials produced for war purposes, and means were developed to eliminate the interior ruptures that occur in untreated alloy and carbon steels when produced in massive sections. These ruptures are related to the interior ruptures, commonly called shatter

with compressed air, the area thus treated can be brought to a hardness of 375 to 400. From this area the hardness decreases gradually to that of the remainder of the rail in a distance of 12 to 15 in., measured along the top of the rail, and from 1¾ to 2 in. downward along the ends of the section. However, these distances can easily be regulated as desired. The heat contained in the rail draws the air-quenched part back slightly so that there is no sharp line or zone of demarcation between the hardened and unhardened areas. There is, therefore, no plane or zone along which a split or fracture can take place in service.

It has been stressed that one of the important features of the normalized process is the refinement of the grain structure. Figure 6 illustrates this refinement in normalized rails, as compared with the coarser grain structure in rails of the same carbon content when cooled on the hot bed.

Ductility Tests on Normalized and Ordinary Rails

B rail, Ingot 12, heat No. 54031—normalized

Specimen	No. of blows	Permanent set-inches	Per cent of elongation per inch					
			1	2	3	4	5	6
1	1	0.80						
	2	1.40	6	7	8	8	7	5
	3	1.95						
	4	2.35						
	5	2.90						
	6	3.40	13	16	16	11	10	9
		Twisted—test discontinued						
2	1	0.80						
	2	1.40	5	8	9	8	7	6
	3	1.90						
	4	2.40						
	5	Broke	8	9	12	15	16	12
3	1	0.80						
	2	1.35	5	7	7	6	5	4
	3	1.90						
	4	2.30						
	5	2.80						
	6	3.40	12	16	15	13	10	9
		Twisted—test discontinued						
	B rail, Ingot 13, heat No. 54031—cooled on hot bed							
1	1	Broke	1	2	2	2	3	2
2	1	0.80						
	2	Broke	3	3	3	4	4	4
3	1	Broke	2	2	3	3	3	2

How Normalizing Increases Ductility

Ductility combined with hardness is an important requisite for a satisfactory rail, for which reason many tests have been made to determine the comparative ductility of normalized rails and of rails cooled on the hot bed. To insure that this comparison will be dependable, two companion rails, say B rails, are taken from different ingots of the same heat. One of these rails is normalized, while the other is allowed to cool in the regular way. Both are cut into six pieces for testing in a standard drop-testing machine, the tup having a 22-ft. drop. Record is made of the number of blows required either to break or twist the specimens so that the test cannot be continued, the amount of permanent set under each blow and the per cent of elongation in each of six inches measured on the head of the rail. The table gives the results obtained from three specimens from each of two companion rails tested in this manner, which are typical of the results obtained from a large number of such tests. These results give a clear indication of the greater ductility in normalized rails, which is brought about by the thermal treatment.

Normalized rails have a refined grain structure, low internal stresses, a high degree of ductility combined with satisfactory hardness, great resistance to impact, and hardened ends. These characteristics should insure freedom from most of the weaknesses found in rails now in service, especially at low temperatures, such as broken bases, square breaks, transverse fissures, etc.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended February 16 totaled 581,981 cars, a decrease of 10,579 cars as compared with the previous week and of 18,287 cars as compared with the corresponding week of last year. This was, however, an increase of 64,452 cars over the total for the corresponding week of 1933 and the cumulative total for the year to date is slightly above that for last year. The decrease as compared with the week before was largely in coal loading. Miscellaneous freight showed increases over last year and the week before but all other commodity classifications except forest products showed reductions as compared with last year. The summary, as compiled by the Car Service Division of the Association of American Railroads, follows:

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Southern	87,358	92,617	80,420
Northwestern	67,694	67,161	60,250
Central Western	79,364	83,251	76,504
Southwestern	44,682	48,323	43,831
Total Western Districts	191,740	198,735	180,585
Total All Roads	581,981	600,268	517,529
Commodities			
Grain and Grain Products	25,189	30,272	26,129
Live Stock	11,569	16,470	15,509
Coal	140,380	149,429	139,163
Coke	8,038	11,120	7,244
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The freight car surplus for the last half of January averaged 341,918 cars, a decrease of 34,657 cars as compared with the first half of the month. The total included 207,002 box cars, 84,414 coal cars, 26,406 stock cars, and 9,433 refrigerator cars.

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Normalizing Process Perfected for Rails

Offers promise of eliminating transverse fissures and other internal defects—Increases resistance to batter

By John Brunner

Manager, Department of Metallurgy and Inspection, Illinois Steel Company, Chicago

THROUGH intensive research and experimentation, the Illinois Steel Company has perfected a new process for the manufacture of rail, known as normalizing, which produces rails with greater ductility and resistance to impact, and also with greater resistance to wear and to end batter. More important, it is believed to eliminate those conditions which give rise to transverse fissures and other interior defects.

This process is the result of more than twenty-five years of research on the part of the rail-producing subsidiaries of the United States Steel Corporation. In this research the quality of the rail steels has been studied and investigations and experiments have been undertaken to determine ways and means for further improvement. These research activities have been carried on in the laboratories and at the rail mills of the Illinois Steel Company under the supervision of the writer and A. D. Beers, in consultation with the metallurgical staffs of the other rail producing subsidiaries, and with the personnel of the research laboratories, of the United States Steel Corporation.

Finding Why Rails Break

To give a clearer understanding of the process that has been developed and of its effect on the rails produced, it is necessary to review the investigations that were made and particularly the information that was obtained from them. One of the first of these investigations was made to determine why rails break more frequently at low than at high temperatures. Special equipment was devised to produce the desired temperatures, and impact tests were made on full-sized specimens of rail, at various temperatures between 45 deg. below and 60 deg. above zero. These tests showed conclusively that the impact resistance of rails decreases rapidly with the temperature of the steel within the range covered by these tests, this being particularly noticeable in rails having hardening properties such as are required by current specifications.

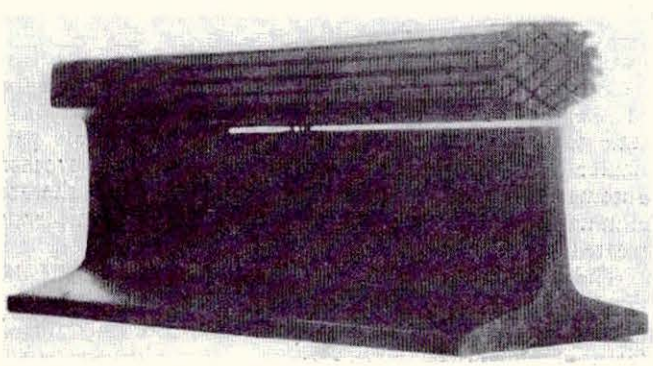

Fig. 1—Method of Sawing Rails to Determine Internal Stresses

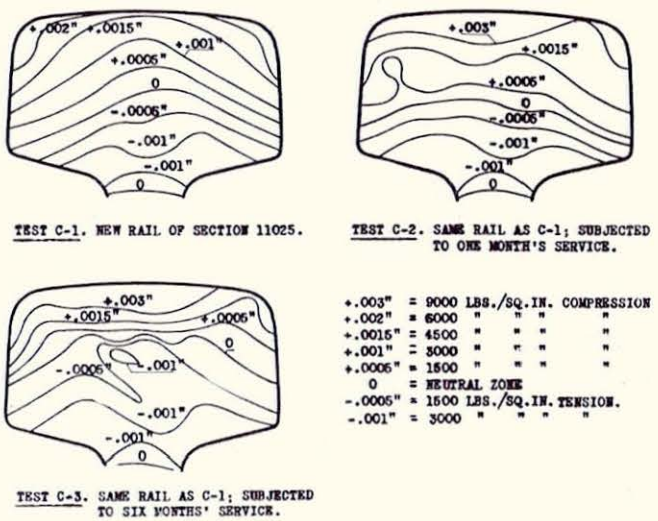
+.002" +.0015" +.001" +.0005" 0 -.0005" -.001" -.001" 0
TEST C-1. NEW RAIL OF SECTION 11025.
+.003" +.0015" +.0005" 0 -.0005" -.001" -.001" 0
TEST C-2. SAME RAIL AS C-1; SUBJECTED TO ONE MONTH'S SERVICE.
+.003" +.0015" +.0005" 0 -.0005" -.001" -.001" -.001" 0
TEST C-3. SAME RAIL AS C-1; SUBJECTED TO SIX MONTHS' SERVICE.
+.003" = 9000 LBS./SQ.IN. COMPRESSION
+.002" = 6000 " " " "
+.0015" = 4500 " " " "
+.001" = 3000 " " " "
+.0005" = 1500 " " " "
0 = NEUTRAL ZONE
-.0005" = 1500 LBS./SQ.IN. TENSION.
-.001" = 3000 " " " "

Fig. 2—Magnitude and Distribution of Stresses in a Rail Cooled on the Hot Bed, When New and After One and Six Months of Service

About the time that the foregoing investigation, which required 2½ years to complete, was finished, transverse fissures were beginning to be a problem and attention was turned to this defect and its causes. It was soon found that the so-called transverse fissure, or interior progressive fracture, could be produced in about the middle of the head in new rails, by repeated stresses approaching the yield strength of the steel. It was also found that their exact location depended on the place of application of the load on the running surface of the rail. Not the least important of the information obtained in these investigations, and which finally pointed the way to the development of the normalizing process, was that both the fractures at low temperature and the fatigue failures resulting from repeated stresses, invariably started in the coarser grain structure in the interior of the head of the rail and spread to the surface.

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Further investigation was interrupted by the World War but was resumed immediately after it closed. During this period, however, rapid strides were made in the thermal treatment of steel in connection with ordnance and munition materials produced for war purposes, and means were developed to eliminate the interior ruptures that occur in untreated alloy and carbon steels when produced in massive sections. These ruptures are related to the interior ruptures, commonly called shatter

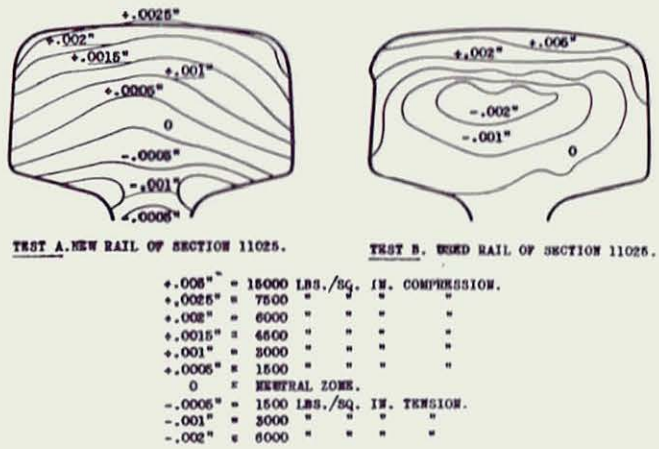

Fig. 3—Stress Distribution in a New Rail and in a Rail After Four Years of Service

cracks, which were later found to exist in the interior of the rail head.

Utilizing the information developed in the ordnance and munition studies, so far as it could be applied to the manufacture of rail, several processes of thermal treatment were tried out with the object of improving both the strength and quality of rails. These included controlled cooling, reheating and quenching in various quenching media with subsequent drawing or stress-relieving methods, and special methods of normalizing.

It should be kept in mind that since the interior fractures have their beginning in the coarser grain structure near the middle of the rail head, one essential for preventing their inception is to refine this grain structure. The investigations developed that while either of the first two processes mentioned improved the quality of the rails, as compared with rails produced by the ordinary process, the cost of one was so great as to be economically impracticable and the other did not give the desired grain refinement.

On the other hand, the normalizing process was found to be free from either of these objections, since it not only refines the grain structure of the steel, but within the proper ranges of preliminary cooling, reheating and final cooling, it also prevents the formation of thermal ruptures, or shatter cracks, while the cost of normalizing is within the limit of economic feasibility. Furthermore, the facility with which this process can be regulated insures that the product will be uniform, that the internal stresses will be reduced to the minimum and that thermal ruptures will be eliminated.

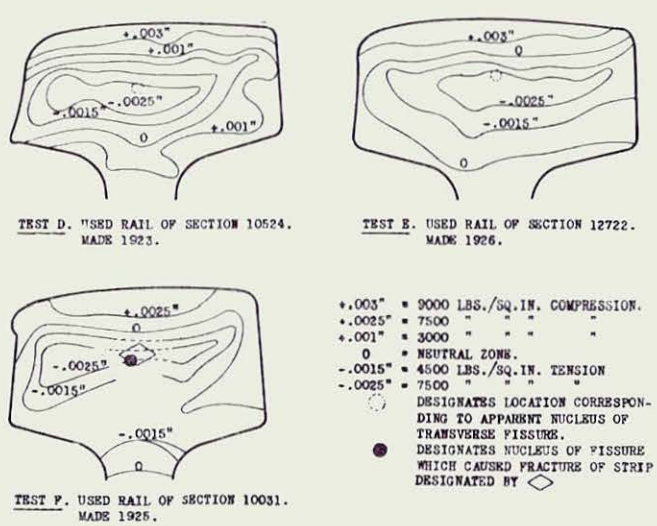

Fig. 4—Stress Diagrams of Rails Having Internal Fissures

How the Metal Is Normalized

In cooling from the molten state, steel passes through numerous stages, one of which is known as the critical range, in which important changes take place in the character and properties of the metal. At a somewhat lower temperature it enters what is known as the brittle range, when it is again subjected to important internal influences. In applying the normalizing process the rails, after rolling, are not allowed to cool through the brittle ranges until they have been subjected to the thermal treatment and have thus obtained a refined grain structure having sufficient ductility to resist the cooling stresses without rupture. As a result, the rolling and cooling stresses which are produced in the rail mill are reduced to the minimum.

In the further development of the process, a method was added of hardening the ends of the rails before final cooling. With this addition, rails are produced which have a high resistance to wear and end batter, as well as a high rating with respect to safety, thus fulfilling two of the most important requirements for service.

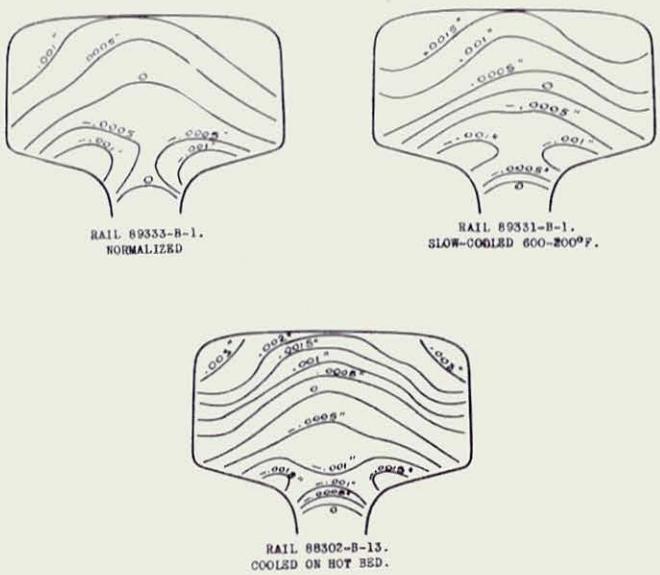

Fig. 5—Stress Diagram of a Normalized Rail, of One Cooled Slowly and One Cooled on the Hot Bed. Numbers Indicate Same Stresses as in Figs. 1 to 3 Inclusive

In outline, the process consists first of air-cooling the rails after they leave the rolls, until the temperature in the interior of the section is slightly below the so-called thermal critical range, but above the thermal brittle range. The rails are then placed in a furnace and reheated under careful control until the entire section has reached a uniform temperature slightly above the thermal critical range. They are then removed from the furnace and blasts of compressed air are applied to the top of the head at both ends of each rail for a sufficient time to bring about the desired hardness at these particular locations. As an essential feature of the process, automatic regulation is applied at every step thereby eliminating the human equation and assuring a uniformly treated product.

The most severe and searching tests that can be devised for application in the laboratory have indicated that normalized rails are markedly superior to rails manufactured by the ordinary process. In addition to the laboratory tests, rails produced by this process in an

experimental furnace have been laid in test sections on a number of roads, in locations chosen to include a wide range of conditions. These rails are being watched closely and compared with similar rails that are cooled on the hot bed and, in some cases, with slowly cooled rails. Measurements are being made periodically to determine the rate of wear and batter, and other features of their performance are being observed carefully. While these tests cannot be completed until after long service, approaching the life of a large number of rails, the results thus far obtained point to the same conclusions as those that were made in the laboratory.

Magnitude and Distribution of Internal Stresses

It has long been known that some of the troubles that have been experienced with rails in service, such as shatter cracks in the coarse grain structure which form the nuclei of transverse fissures, can be traced to strains that have been set up in the interior of the section during rolling and cooling. What had not been known definitely, however, was the magnitude and distribution of these stresses. Since this information was considered to be vital in any attempt to improve the quality of the rails, a method was devised for determining both the magnitude and distribution of the stresses.

In applying this method, the end of the rail is machined and ground carefully to obtain an accurate plane surface exactly at right angles to the longitudinal axis of the rail. The head is then divided into a number of diamond-shaped elements, as shown in Fig. 1, and cut apart for a predetermined distance by means of a band saw, extreme care being exercised not to alter the temperature of the steel during the operation. As soon as the sawing is completed, the sections are separated by steel bands of the same thickness as the width of the cut, and the entire rail head is tied together with wire, so that each piece is drawn back to its original position.

As the sawing progresses, the individual elements are released from their former restraint and those which were under compression elongate, while those lying in the tension area contract. The several elements thus become of unequal length and by measuring the amount of elongation or contraction, the kind, the magnitude and the distribution of the stresses in the head can be determined. As these readings are taken, the sections of equal length are plotted on a diagram of the head and curves are drawn through the points so plotted. These curves indicate the lines of equal stress in the rail head before it was cut into the elements shown in the illustration.

To give an idea of the magnitude of these stresses and how they are located in the section, as well as the effect that traffic has on them, several typical diagrams are reproduced. Figure 2 shows the magnitude and distribution of the stresses in a 110-lb. rail as it came from the hot bed; in the same rail after it had been in the track for one month and had carried 200,000 tons of traffic; and again after it had carried 1,000,000 tons during a period of six months. Figure 3 shows the stresses in another 110-lb. rail as it came from the hot bed, and includes a stress diagram of still another rail of the same section after about four years of service. Figure 4 reproduces the stress diagrams of three rails that were laid in 1923, 1925 and 1926, respectively, and which were found to contain transverse fissures, the location of the nuclei being shown for each section. In test F in this figure, a small fissure was encountered near the center of the head, which caused the strip in which it was located to break after the sawing was completed. As a matter of comparison, Fig. 5 contains stress diagrams of three 131-lb. rails, the first of which was reproduced by the normalizing process, the second was allowed to cool slowly, and the third was cooled in the usual way on the hot bed. The magnitude and distribution of the stresses in these unused rails make an interesting and informative study.

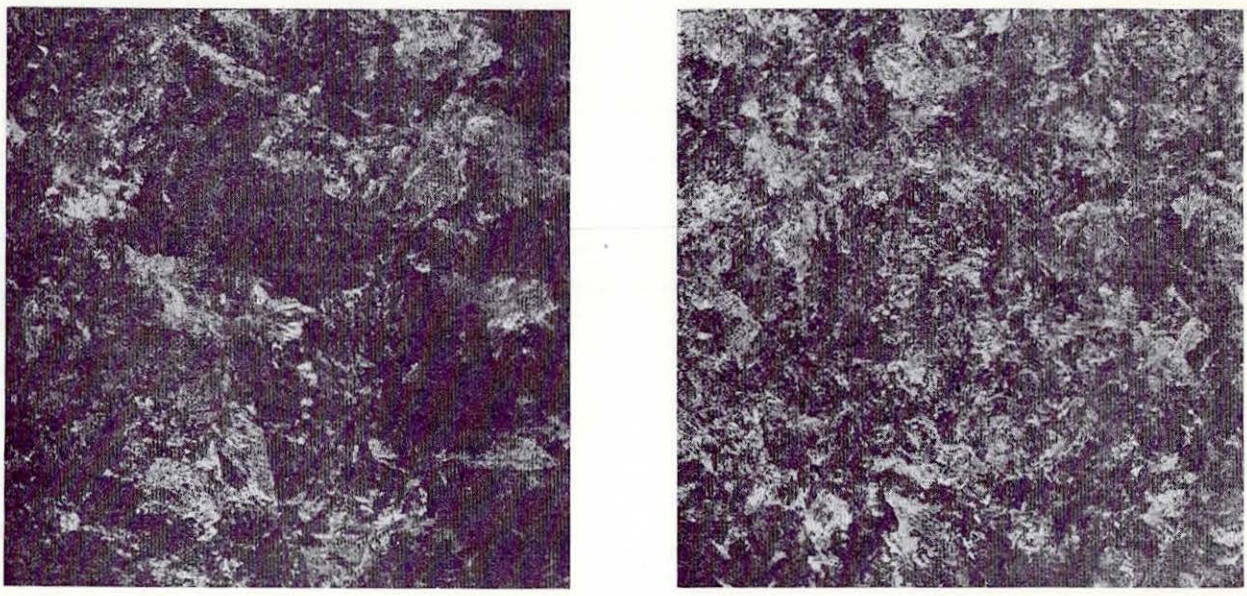

Fig. 6—Photomicrograph (magnification 100 times) of Nital-Etched Rails of 0.82 Carbon Content. At Left, as Rolled. At Right, after Normalizing

In determining the interior stresses in the rail head, literally hundreds of rails were cut apart in the manner described. The few that have been reproduced have been selected as typical of the various conditions that were found in both used and unused rails. It is a significant fact that, without exception, the stress lines in rails that had been in service for some time had changed, as compared with unused rails, and had moved upward toward or beyond the center of the rail head.

Brinell Hardness of Normalized Rail

Normalized rails have a hardness substantially the same as that of rails cooled on the hot bed, or from 250 to 260 on the Brinell scale. By quenching the ends

with compressed air, the area thus treated can be brought to a hardness of 375 to 400. From this area the hardness decreases gradually to that of the remainder of the rail in a distance of 12 to 15 in., measured along the top of the rail, and from 1¾ to 2 in. downward along the ends of the section. However, these distances can easily be regulated as desired. The heat contained in the rail draws the air-quenched part back slightly so that there is no sharp line or zone of demarcation between the hardened and unhardened areas. There is, therefore, no plane or zone along which a split or fracture can take place in service.

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Factors Affecting the Cost of Locomotive Repairs*

Statistical evaluation of miles between shoppings, intensity of utilization, age and power in relation to locomotive maintenance expense

By Hubert J. Titus

Transportation Engineer, Franklin Railway Supply Company, New York

THOUGH a large number of locomotives have been retired during recent years, there still remain some 50,000 steam locomotives on the railways of the United States. During the present abnormal conditions the total sums expended for maintaining the active locomotives are somewhat less than the $400,000,000 annually spent during normal times, but even under the present conditions, when approximately $300,000,000 are expended, the relationship of maintenance expense to the other direct expenses of operation, which include fuel, wages, enginehouse expense and locomotive and train supplies, remains practically the same. For several years these expenses have constituted approximately 31 per cent of all direct expenses of operation and occupy first place of all the expenses going to make up the direct operating expense.

Because of the bearing of such expenses not only on the operation, but also on the design of locomotives, studies have been undertaken to determine, if possible, a method whereby fairly accurate predictions can be made when considering some of the important variable factors which influence these expenses. Of course, a reliable prediction of expenses would prove of great advantage in possibly forecasting a given operation. The greatest benefit to be derived from such a study, however, is offered in the analysis of the effects produced on expenses by each of the independent variables, as well as those produced when these variables act in combination with each other.

For instance, it is well known that the miles between general repairs have a great influence on the total cost of maintenance as well as on the cost per mile of operation. It would appear that a study of this character would make possible the determination of the objective mileage between general repairs as well as the limits within which such mileage would fall in order to obtain the minimum cost per mile of operation. If the power of a locomotive affects these expenses to any great degree, such a study will make possible the determination of the most economical mileage between general repairs for each class or group of locomotives.

Further, if a locomotive is to be replaced a study of this character should provide a means of determining the most economical way of obtaining the necessary starting power; that is, the study should indicate whether or not all of the necessary power should be provided through the main cylinders, or the main cylinders and a supplementary power unit. In the event that age is an important factor it would be possible to determine the most economical shopping mileage suitable for given age increments. Further, it may be possible to determine from the maintenance expenses the approximate age when increased expenses might make it advantageous to replace power units to the end that these operating expenses could be reduced. If an analysis of maintenance expenses can accomplish these results, it would appear that a very useful tool would be had for further controlling these expenses which are of such great magnitude.

General Conditions of the Study

An accurate study of this character is rather restricted because of the meagre data available. This is true not only of the expenses, but also of other closely related items which might seriously affect these expenses. As a matter of fact relatively few roads maintain records of individual locomotive performance. Such records as are maintained refer to the performance of groups of locomotives.

The maintenance expenses are, of course, expressed in dollars. However, they are merely an indirect means of expressing the deterioration which takes place in a locomotive due to natural causes. The actual replacement, of course, takes the form of man-hours and materials. With expenses being representative of the deterioration which occurs, we are aware that the actual dollars expended are influenced by the increasing or decreasing value of labor and materials. Thus, in such a study, consideration has been given to a period when changes in prices were at a minimum.

As to the maintenance expenses themselves, we have confined the data to the actual expenditures for labor

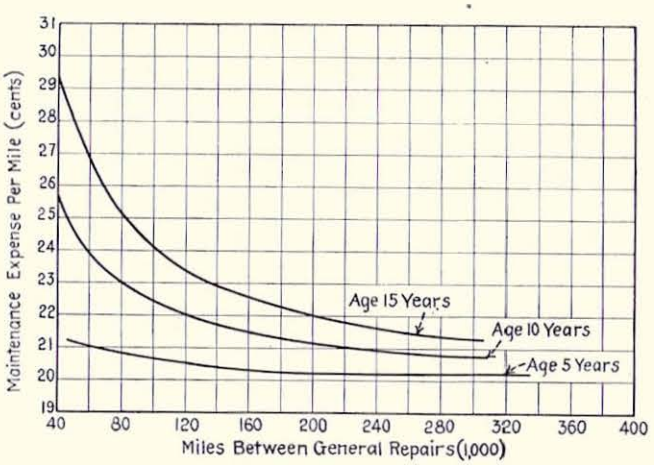

Fig. 1—Variation of Maintenance Expense with Miles Between General Repairs

* Abstract of a paper presented before the annual meeting of the American Association for the Advancement of Science and Associated Societies, held at Pittsburgh, Pa., December 29, 1934.

and material. We have not included in these expenses the usual allowances for overhead and stores expense. Thus, under these conditions the expenses will more truly reflect the deterioration which has taken place.

The wear and deterioration in a locomotive as represented by the expenses are brought about by many factors, most important of which are the following:

1 Mileage between repairs
2 Utilization or miles per period of time
3 Power of the locomotive
4 Age of the locomotive
5 Speed of operation
6 Load factor
7 Locomotive design
8 Quality of materials used
9 Method of operating the locomotive
10 Method of washing boilers and time interval
11 Topography of the territory over which operated
12 Permissible limits of wear
13 Methods of inspection
14 Efficiency of labor
15 Condition of shops
16 Condition of shop tools
17 Length of locomotive runs
18 Water conditions
19 Amount of traffic
20 Shop facilities

If progress is to be made in a study of locomotive maintenance, it is necessary, if possible, to consider data covering all of the known causes resulting in wear and deterioration to a locomotive. This, in turn, implies the use of statistics. If the results of a study are to be of any use in predicting further economies or estimating expenses, such data as are available must be obtained under the same essential conditions with respect to the various causes outlined. This condition makes it impossible to consider the roads of the country as a whole. It also makes it impossible to consider the roads of any particular section. The study must be confined to an individual road. In conducting the study we have met this condition. The data procured in each case covered ranges of power normally encountered and was obtained for the same periods of time. All data were procured in most instances for the individual locomotives rather than groups of locomotives.

In view of the fact that the study was confined to one road during a period when underlying conditions were practically constant, it will be observed in reviewing the various causes previously enumerated that only the first five causes—miles between general repairs, utilization, power of the locomotive, age and speed—need be considered as variable. The other causes will remain constant. As a matter of fact, it is the causes which remain constant for one section of a road, or a road as a whole, which actually make it impossible to consider data from several roads in a group. If several roads were considered, it will be noted that the number of assignable causes of variation in maintenance become large and present a problem most difficult of solution.

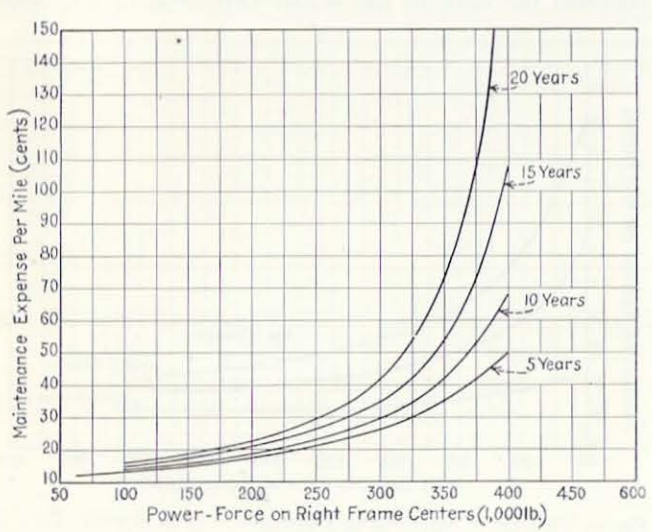

Fig. 2—Variation of Maintenance Expense with Power for Constant Age

In this problem the miles between general repairs are the total mileage accumulated since leaving the shops at the last general repair up to the time of going into the shop again for a similar class of repair.

The utilization of the locomotive is expressed in miles per month and represents the average miles operated per month between general repairs. Utilization could be expressed as the miles operated annually or any other suitable basis, taking into consideration the time of use.

The power as here used may be any one of the many factors which may be used to compare the size of a locomotive. The unit used, however, must be closely associated with maintenance expense.

The age of locomotives as here used is the active age of the locomotive. This is only one portion of the total age, the other being that portion of the age obtained when the locomotive is stored. Use of the active age approximates the total accumulated mileage of the locomotive, which would perhaps be a better factor to use were it available.

The speed of operation cannot be obtained for individual locomotive operation and, consequently, in the present study is unaccounted for and considered as an unknown cause.

Method of Analysis of Existing Data

As a start, consideration will be given only to the foremost variables affecting these expenses, such as power or type of locomotive, miles between shopping, utilization or miles per month and the age of the locomotive. Obviously we could, if sufficient data were available and time permitted, investigate such data by holding certain variables constant and determining to what extent maintenance expense varied with each of the variables. Such a method would be very cumbersome if it could be used. In the case at hand two variables entering into costs—namely, price of labor and costs of materials—do not permit of sufficient length of time to procure the necessary data without change. We must, therefore, utilize some method of analysis whereby reliable results may be procured from a relatively few observations, assuming that the time interval is sufficiently short and that price of labor and materials will be constant.

Reference has been made to the power of the locomotive. In this connection it might be stated that the results might vary according to the unit selected to represent power. It is well known that the power of a locomotive can be represented in several ways, the most widely used units being the tractive force and indicated horsepower. Other units which have been used to express power are the potential horsepower based on boiler dimensions together with steam rates of the cylinders and the piston thrust. Another unit of measuring the power of a locomotive is the forces imposed on the locomotive frame at the axle centers. All of these units could be developed to give an approximation of the power and in turn the total work done by a locomotive.

In this study we are faced with the selection of a unit representative of the power of the locomotive which will

bear some relation to the work done by a locomotive. Naturally, the best unit to use would be the foot pounds of work done or the total drawbar horsepower expended. Such units, however, are not available. Furthermore, it is impractical to obtain such units from every-day operation. We must, therefore, obtain some unit which will indirectly measure the work done. Among such units which may be used in addition to those previously enumerated are total fuel consumed, total evaporation of the locomotive boiler, total weight on locomotive drivers and possibly the total weight of the locomotive itself. We have no advance knowledge as to which one of the various units mentioned will best express power in relation to maintenance expense. We must, therefore, select an approach to the problem which will definitely indicate the unit yielding the most reliable results in the estimation of these expenses. To accomplish this end we have used the observations from individual locomotives. These individual observations were handled by multiple correlation, using the various measures of power. The unit of power yielding the highest correlation, if there is a difference between the units of power, should be used in the further study of the problem.

In dealing with data wherein five variables are considered and assuming the four independent variables mentioned to be most important, we must resort to multiple correlation if we are to be able to predict maintenance expenses or if we are to study the effects of each independent variable on such expenses.

After determining that the data are predictable, we can assume a statistical relationship existing between the data as follows:

$$\text{Let } 10{,}000\ X_1 \qquad \frac{10{,}000\ X_1}{X_3\ X_5} = a + b\ X_1 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

where

X_1 = total cost of maintenance between shopping in dollars
X_5 = potential horsepower of the locomotive
X_3 = the utilization or miles annually
X_4 = age of locomotive
a and b = constants determined from the data

Assuming that an equation of this type will fit the data, we should obtain the necessary statistics so that the results may later be compared to those obtained by other equations which could be used. The use of least squares makes it possible to determine if an equation of this type does fit the data.

On the other hand, we can assume the following statistical relationship:

$$X_1 = a + b\ X_2 + c\ X_3 + d\ X_4 + e\ X_5 \ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

where

X_1 = total cost of maintenance
X_2 = miles between shopping
X_3 = utilization or miles per month
X_4 = age of locomotive
X_5 = power of locomotive to some suitable unit
a, b, c, d, e = constants obtained from the data.

Before determining whether or not one type of equation would make possible better predictions than another, it would appear advisable to consider an equation such as type (2) in order to obtain the partial correlations. From these we can determine if the variables considered really improve predictions as they are included. It is quite possible that some of the variables may be highly correlated with each other and, consequently, would not add greatly to prediction. Further,

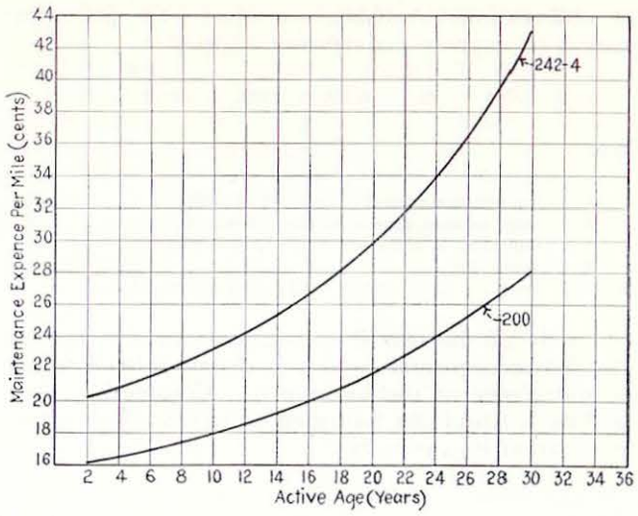

Fig. 3—Variation of Maintenance Expenses with Age for Locomotives of the Same Power

such a study of partial correlations may indicate that some variables show inconsistencies in the results and are, therefore, unreliable for predictive purposes.

After determining whether or not all of the assumed major causes or variables are of sufficient importance to be retained in the study, we may decide on whether or not an equation of type (1) or type (2), or possibly a curvalinear equation, would be better suited to this problem. To accomplish this end we may make use of the same unit of power in all instances and determine the correlation coefficients and error of estimate. A comparison of these statistics will indicate the form of equation which will give the best prediction.

After determining the type of equation to use we may substitute for X_5 in this equation the various measures of power (potential horsepower, tractive force, piston thrust or force on the frame center of one side of the locomotive) in order to determine the statistics necessary for comparing predictions. This comparison will indicate which unit of power will be most advantageous in the prediction of maintenance expense. In order that we might be reasonably certain of the results when using the unit of power and type of equation best suited, considering all the data on a road, a similar analysis was made of the single groups of freight locomotives with the largest number of observations. As a final step a partial correlation was made for each of the independent variables in both groups to determine their effect on maintenance expense when all of the other variables were held constant.

Application of the Method

Using equation (2) and substituting for power (X_5) the various units (potential horsepower, tractive force, piston thrust and force on the frame centers) we find that there is no real difference in the correlation coefficient and conclude that any one of the units will yield equally reliable results. In this connection it might be stated that although no differences exist between the units for the data available, we do believe that potential horsepower will not be reliable under all conditions of changing locomotive designs. Its value can be changed appreciably by an alteration in the boiler design, whereas the other units would remain unaltered. Under these conditions we prefer to use one of the other three units and have selected the force at the frame centers for a continuation of the study.

Determining the constants for the equation from the

Hearings on Eastman Bills

Co-ordinator's program of transportation legislation gets uncertain start in Congress

WASHINGTON, D. C.

THE Eastman program of transportation legislation is getting its start in Congress under conditions about as chaotic as those in the industry which it aims to correct, although President Roosevelt was reported to be working this week on his message to Congress on the subject which it was hoped might clarify the situation somewhat.

The President had promised to send to Congress a message dealing with the general transportation question and the principle of co-ordinating the regulation of all forms of transportation, about a week after his message dealing with ocean shipping questions, which was promised for last week, but the latter has been further delayed. He has frequently indicated his desire for co-ordinated regulation, but has said little to indicate that he is especially interested in the details of such a program beyond the main feature of the set-up. Those interested in the subject have long been waiting for a message indicating that he proposes to get behind such a program, and for a time it was fairly generally assumed that his insistence upon it could be counted upon as reasonable assurance of its enactment.

However, the situation has changed rapidly of late. The recent performances of the Senate, and particularly the experience of the President's work-relief bill, have demonstrated that the large Democratic majority is not exactly under the control of its leaders and there are many indications that Congress is far less inclined to respond promptly to the wishes of the Executive than it was last year. Neither has Congress demonstrated any particular leadership of its own. There is a farm bloc, a labor bloc, bonus, silver and inflation blocs, and others, but there is no railroad or transportation bloc.

Moreover, the fact that Congress has already consumed more time than was expected in considering the various proposals already laid before it, and that two months of the session have already elapsed, means that the transportation legislative program, many features of which have strong opposition, is already getting a late start. Mr. Eastman's report went to Congress on January 30, but by the time it is given some impetus by the President's message it will be almost as late in the session as the date of his last year's report, which was regarded as too late to do anything about it.

The program has been given a start, because Eastman's bills have been introduced, except that the fourth section bill still lacks a sponsor in the Senate, and hearings on some of them have been undertaken. However, there have been many hearings before and one of the noticeable features of Congressional practice is that the longer hearings are held in the absence of a definite leadership and purpose to produce results, the less the likelihood of action. Only one of the bills, the motor carrier bill, has been taken up by the House committee, and it is understood that it proposes to hold hearings on its holding company bill before taking up the subject of transportation very actively, while the water carrier bill has been transferred to the committee on merchant marine and fisheries. Moreover, so far as the hearings have progressed, there has been little evidence of interest on the part of committee members in the bills, such as is expected in the case of bills they have initiated themselves, or even those specifically sent up from the White House.

Hearings Before Senate Committee

Hearings were begun on February 25 before the Senate committee on interstate commerce on three of the bills recommended by Co-ordinator Eastman, S. 1629, the motor carrier bill, S. 1632, the water carrier bill, and S. 1635, the bill to reorganize and enlarge the Interstate Commerce Commission. Chairman Wheeler said it would be the purpose to continue the hearings from day to day until they are completed with a view to reaching a conclusion on the three bills. No indication has been given as to when other bills recommended by Mr. Eastman will be taken up.

Mr. Eastman was the first witness before the committee, repeating largely the statement he had made the week before before the House committee, based on the conclusions expressed in his report to the President and Congress as to the need for regulation of competing forms of transportation for the benefit of the carriers themselves and in the public interest. As is usual in this committee, however, Senators Wheeler and Couzens attempted to do much of the testifying themselves by frequent interruptions with questions reflecting on the railroads. Senator Couzens, referring to the long period which elapsed before effective regulation of the railroads was attempted, asked Mr. Eastman if he would not give the truck operators the same opportunity for experience that was given the railroads. Mr. Eastman replied that the government had also gained experience and had learned what ought to be done with respect to all classes of carriers.

When Senator Wheeler asked if the railroads had not paid out an excessive part of their revenues in dividends instead of retiring debt he replied that although some railroads were badly capitalized the situation was not so bad as the Senator had suggested and that the earnings were by no means all paid out in dividends. A large part of the improvements made between 1920 and 1930, he said, approximately $4,500,000,000, had been paid for out of earnings. This might have been used to retire bonds, but if it had it would have been necessary to issue new securities to provide for the improvements and a number of roads that were in a position to do so had retired indebtedness by issuing stock. He said that in his opinion that is the best way to retire debt.

Senator Wheeler also spoke of the state regulatory laws relating to motor vehicles as having been adopted "under the ægis of the railroads" and of the tremendous sums expended by the railroads to bring about regulation of their competitors. Mr. Eastman answered that according to his observation the motor vehicle manufacturers have an organization "quite as powerful as the railroads" and that he did not understand that the railroads had spent any tremendous sums. He said he knew they had been active with propaganda and in other ways, but that "so has the other side, which is very well

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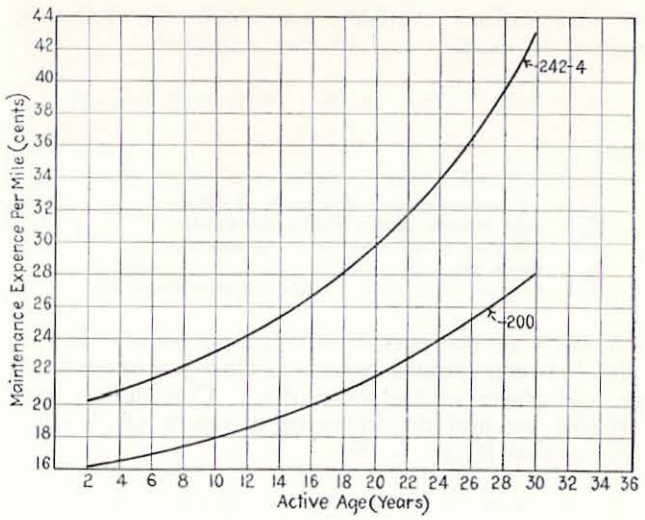

Fig. 3—Variation of Maintenance Expenses with Age for Locomotives of the Same Power

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Determining the constants for the equation from the

148 observations available, we obtain the following equation to express maintenance expense:

$$X_1 = -2.7 + 0.2X_2 - 3.55X_3 + 0.03X_4 + 0.062X_5 \quad (3)$$

where

X_1 = maintenance expense (thousands of dollars)
X_2 = miles between general repairs (thousands)
X_3 = utilization or miles per month (thousands)
X_4 = active age
X_5 = force on frame centers (right side) (thousand lb.)

A study of the partial correlations reveals that the miles between general repairs is closely related to the age and power of the locomotive. Considering these variables we find the following equation which shows a correlation $R_{2.45} = .57$:

$$X_2 = 230{,}500 - 2{,}600X_4 - 0.43X_5 \quad (4)$$

where

X_2 = miles between general repairs
X_4 = active age (years)
X_5 = force at frame centers, lb. (right side)

When considering the miles per month we also found a relation between age and power. The following equation gives the relation:

$$X_3 = 5{,}452 - 93.1X_4 - 0.0067X_5 \quad (5)$$

In this equation X_3 is the miles per month as expressed in miles. X_4 and X_5 are the same values as used with the preceding equation.

Important Factors in Controlling Maintenance Expense

From equation (3) it is noted that the maintenance expenses increased with miles between general repairs, age and power, and are reduced as the miles per month are increased. It is further noted that the age as here used does not contribute much to these expenses. The largest contribution comes from miles between general repairs and power. From equations (4) and (5) we find that age contributes substantially to a reduction in the miles between general repairs and miles per month which in turn are important in evaluating and possibly controlling maintenance expense.

With the use of these equations the maintenance expense per mile of operation for different miles between general repairs were determined for one class of locomotive for different ages. The results are shown in Fig. 1. From this information we conclude that the highest possible miles between shopping should be obtained for the greatest economy. Further, while objective miles between shopping are not of so much importance with the new locomotives, it is shown that as the engine grows older such objective mileage should be attained.

Considering the effect of power on the maintenance expense not only for the power itself, but also from its effect on miles between general repairs and utilization, we show on Fig. 2 the results for different ages of the locomotive. From this chart it will be observed that the maintenance expense per mile increases as the power, the increases becoming greater with the greater power. In addition, as the engines become older the increases due to power become considerably greater. From these data we conclude that a locomotive with the least power possible through the main cylinders and using auxiliary power for starting conditions will give substantial reductions in the maintenance expense per mile of operation. This saving will become increasingly greater as the locomotives become older.

On Fig. 3 are shown the effects of age on maintenance expense for two classes of locomotives of different power. These variations in maintenance expense with age are due mainly to the effect of age on miles between general repairs and the utilization. During the early life of the locomotive the maintenance expense increases at a fairly constant rate, but during the later life the increase is more marked. Also, if the two classes of locomotives are compared it is noted that the increases for the heavier locomotives are more pronounced than for the lighter engine. From this chart we conclude that age, when considered in conjunction with power and as they affect miles between general repairs and utilization, has a decided effect on maintenance expense.

The results which have been depicted lead to the conclusion that maintenance expense of locomotives can be predicted at least within limits. Furthermore, with a knowledge of the action of the variables of miles between general repairs and miles per month, it is possible to estimate the real effect of power and age on the maintenance expense of locomotives. This knowledge of the results produced on maintenance expense by the major variables should not only make it possible to determine in advance the results to be obtained with new locomotives, but should also make it possible to determine the most effective means of reducing the maintenance expense for existing locomotives, as well as possibly determining when such locomotives become uneconomical for specific operations. Only through a complete analysis along these lines, when considering the important variables, will it be possible to determine and reach the ultimate goal of minimum expenses for maintaining steam locomotives.

Railroad Views of R. F. C. Chairman*

By Jesse H. Jones†

THERE is nothing new in the statement that social progress follows closely the development of transportation, and I shall make no attempt to carry you through the various stages of this development. Truly progressive, we no sooner get one method of travel fairly well perfected, than another is developed to take its place. Therefore, any effort to solve traffic problems inevitably must lead to many difficult and conflicting situations.

We want the new, and yet much of the old is necessary and must be preserved. How to go on progressing in this respect in the interest of the general welfare, without too much inconvenience and destruction of property value, is truly a major question. The answer, at least for the time being, is to find ways and means of using them all, and without too much waste.

We must continue to develop better means of travel and traffic, but should be prudent enough to profit by retrospection, and provide for amortization of the capital investment within the reasonable life of the facility employed, remembering how soon things become old-fashioned and even obsolete.

We develop an excellent system of railroads, serving

* From an address before the Traffic Club of New York on February 21, 1935.
† Chairman of the Reconstruction Finance Corporation.

every nook and corner of the nation, built with private capital and by enterprising initiative. We then proceed to parallel these railroads with competing highways, built and maintained at public expense. This is not said in criticism, but to illustrate one of our inconsistencies. No one wants to do without modern highways, or to retard their further development and use, but railroad and water transportation, so far as anyone can now forsee, will always be necessary.

Code of Fair Competition Needed

What is needed—and *all* that is needed for the immediate future, is a Code of Fair Competition between the various forms of commercial transportation and transportation systems, and this should be established at the earliest possible moment. To do it effectively, and to avoid conflict between regulatory bodies, one authority should control and supervise all interstate traffic, fixing rates and responsibility, and prescribing regulations for service and schedules. There can be a division and allocation of traffic upon the principle of each pound being carried by the agency best suited to carry it, and at the proper rate. All traffic, by whatever agency, should bear its cost.

Our railroads must be maintained and at the highest possible standard, especially lines and systems connecting the principal sections and centers of the country. Shipping and travel by water must be kept abreast with world competition. Coastwise and inland water shipping should be brought under the same regulation as railroad and highway traffic. Our highways must be kept in repair and continually extended. Motor vehicles used in the public service must be maintained and improved. There should be regular, frequent, and dependable air service between all principal points, with proper and adequate landing fields at given distances, and only the most modern flying equipment permitted in public service. With the possible exception of that part which comes into competition with other countries all of this can be accomplished on a basis of the traffic paying the cost, if we have the intelligence and the courage to prescribe and enforce the necessary regulations.

Some Rail Abandonments Inevitable

We are inclined to get away from travel by train, except for the longer distances, and certain types of freight can be moved more satisfactorily by the highway, especially for short distances. So we must look to the inevitable abandonment of some railroad mileage, and some train service. The railroads can regain some of their lost ground by improved equipment, air-conditioned trains, faster schedules, store-door service for freight, etcetera; but this recovery may be offset in part by the continued development of highway and motor service. In many places highway vehicles can be used by railways to supplement their rail service and avoid wasteful duplication.

People have a right to mail service, and to facilities for travel and traffic, but the latter should not be had for one community by taxing another. Taxes are already high enough and numerous enough. If a particular community will not support its railroad and can be served by the highway, chambers of commerce should, in the general interest, co-operate for the elimination of the particular piece of railroad track, rather than oppose its abandonment. I appreciate that no community nor city, large or small, is willing to lose a railroad, a railroad office or shop, or to diminish its population by a single person, but that is a narrow and selfish view when the welfare of the entire country, and that of an industry as important as the railroad industry, is involved.

On one thing we can all agree—the highway is more essential, in the opinion of the individual, to the pleasure and welfare of the greater number of people. If the railway or the highway must be done without, the railroad, if left to the vote, would be the first to go, but we cannot do without either. The automobile has come to be a necessary part of our lives, and automobiles demand good roads.

Railroads Are Necessary

Apropos of this point, I venture to observe that the business which is having the greatest comeback in this out-of-balance period is that of passenger automobiles. This demonstrates clearly what people want most. The fact that we will continue to develop and use our highways, buy more motor cars, and travel by air, does not justify neglecting the railroads.

The railroads are not only necessary, but they employ a great many people, directly and indirectly,—more perhaps than any other industry, notwithstanding possible claims to the contrary by the automotive industry. Without arguing this point, nothing would stimulate business quite as much, and re-employ people to the same extent, as an increase in railroad traffic sufficient to give them money to spend for equipment and maintenance, and for improving their property generally.

It should be remembered, too, that railroads pay a very large amount of taxes necessary in the support of state, county, and municipal governments, including our public schools, while exactly the contrary is true of highways which are built and maintained with tax money.

Much Deferred Maintenance

There is also a great deal of deferred railway maintenance, and much equipment needs to be repaired or replaced. To have fast and safe railroad service, all important main lines should be laid with rail weighing from 100 to 150 lb. That program alone would provide employment for a great many men, the investment of a great deal of money, and would make traffic for several years. Safety and comfort should be the first order in all forms of transportation. We are entitled to the best in everything, and usually the best is the cheapest in the long run.

While we continue to improve our railroads, there should be better co-ordination, and elimination of duplicated services. It is unnecessary to send two trains to do the work of one, or for competing lines between important centers to have identical schedules. Undoubtedly competition provides the spur we need for good service, but certainly much duplication could be eliminated, and the saving used for making more perfect that which is retained.

While we all expect railroad earnings to improve to the extent that the roads may again operate profitably, and in private hands, railroad security holders will perhaps need to take substantial reductions in principal as well as rate of return. Some of our roads will be able to continue under their own power, but others will need reorganization, readjustment of capital structure, and credit which only the government can furnish.

Broad Powers Given to R.F.C.

The Congress has authorized the R.F.C. to assist railroads to a modest degree, where in the opinion of our directors and with the approval of the I.C.C., it can properly be done without apparent loss to the government. We are authorized to lend in aid of reorganiza-

(*Continued on page 337*)

Hearings on Eastman Bills

Co-ordinator's program of transportation legislation gets uncertain start in Congress

WASHINGTON, D. C.

THE Eastman program of transportation legislation is getting its start in Congress under conditions about as chaotic as those in the industry which it aims to correct, although President Roosevelt was reported to be working this week on his message to Congress on the subject which it was hoped might clarify the situation somewhat.

The President had promised to send to Congress a message dealing with the general transportation question and the principle of co-ordinating the regulation of all forms of transportation, about a week after his message dealing with ocean shipping questions, which was promised for last week, but the latter has been further delayed. He has frequently indicated his desire for co-ordinated regulation, but has said little to indicate that he is especially interested in the details of such a program beyond the main feature of the set-up. Those interested in the subject have long been waiting for a message indicating that he proposes to get behind such a program, and for a time it was fairly generally assumed that his insistence upon it could be counted upon as reasonable assurance of its enactment.

However, the situation has changed rapidly of late. The recent performances of the Senate, and particularly the experience of the President's work-relief bill, have demonstrated that the large Democratic majority is not exactly under the control of its leaders and there are many indications that Congress is far less inclined to respond promptly to the wishes of the Executive than it was last year. Neither has Congress demonstrated any particular leadership of its own. There is a farm bloc, a labor bloc, bonus, silver and inflation blocs, and others, but there is no railroad or transportation bloc.

Moreover, the fact that Congress has already consumed more time than was expected in considering the various proposals already laid before it, and that two months of the session have already elapsed, means that the transportation legislative program, many features of which have strong opposition, is already getting a late start. Mr. Eastman's report went to Congress on January 30, but by the time it is given some impetus by the President's message it will be almost as late in the session as the date of his last year's report, which was regarded as too late to do anything about it.

The program has been given a start, because Eastman's bills have been introduced, except that the fourth section bill still lacks a sponsor in the Senate, and hearings on some of them have been undertaken. However, there have been many hearings before and one of the noticeable features of Congressional practice is that the longer hearings are held in the absence of a definite leadership and purpose to produce results, the less the likelihood of action. Only one of the bills, the motor carrier bill, has been taken up by the House committee, and it is understood that it proposes to hold hearings on its holding company bill before taking up the subject of transportation very actively, while the water carrier bill has been transferred to the committee on merchant marine and fisheries. Moreover, so far as the hearings have progressed, there has been little evidence of interest on the part of committee members in the bills, such as is expected in the case of bills they have initiated themselves, or even those specifically sent up from the White House.

Hearings Before Senate Committee

Hearings were begun on February 25 before the Senate committee on interstate commerce on three of the bills recommended by Co-ordinator Eastman, S. 1629, the motor carrier bill, S. 1632, the water carrier bill, and S. 1635, the bill to reorganize and enlarge the Interstate Commerce Commission. Chairman Wheeler said it would be the purpose to continue the hearings from day to day until they are completed with a view to reaching a conclusion on the three bills. No indication has been given as to when other bills recommended by Mr. Eastman will be taken up.

Mr. Eastman was the first witness before the committee, repeating largely the statement he had made the week before before the House committee, based on the conclusions expressed in his report to the President and Congress as to the need for regulation of competing forms of transportation for the benefit of the carriers themselves and in the public interest. As is usual in this committee, however, Senators Wheeler and Couzens attempted to do much of the testifying themselves by frequent interruptions with questions reflecting on the railroads. Senator Couzens, referring to the long period which elapsed before effective regulation of the railroads was attempted, asked Mr. Eastman if he would not give the truck operators the same opportunity for experience that was given the railroads. Mr. Eastman replied that the government had also gained experience and had learned what ought to be done with respect to all classes of carriers.

When Senator Wheeler asked if the railroads had not paid out an excessive part of their revenues in dividends instead of retiring debt he replied that although some railroads were badly capitalized the situation was not so bad as the Senator had suggested and that the earnings were by no means all paid out in dividends. A large part of the improvements made between 1920 and 1930, he said, approximately $4,500,000,000, had been paid for out of earnings. This might have been used to retire bonds, but if it had it would have been necessary to issue new securities to provide for the improvements and a number of roads that were in a position to do so had retired indebtedness by issuing stock. He said that in his opinion that is the best way to retire debt.

Senator Wheeler also spoke of the state regulatory laws relating to motor vehicles as having been adopted "under the ægis of the railroads" and of the tremendous sums expended by the railroads to bring about regulation of their competitors. Mr. Eastman answered that according to his observation the motor vehicle manufacturers have an organization "quite as powerful as the railroads" and that he did not understand that the railroads had spent any tremendous sums. He said he knew they had been active with propaganda and in other ways, but that "so has the other side, which is very well

equipped," and that both have been "modern and up-to-date in their methods."

Mr. Eastman said that there was no intention to suppress the proper development of any form of transportation, but that he hoped the effect would be to compel the raising of truck rates that are below the sound economic level. When Senator Couzens said he assumed it would raise truck rates all over the country, Mr. Eastman said he would not go so far as that and that he should not suppose it would raise any great body of rates although it would tend to prevent the so-called "chiselling operations" that are feared not only by the railroads but by other truck operators. He believed the legislation would tend to strengthen the position of common carrier operators as compared with private and contract carriers by depriving the latter of the opportunity to carry for others at any rates they choose. He declined to agree with Senator Couzens that passage of the bill would "put the little fellow out of business," although he said it would tend to increase the size of the truck operations and he pointed out that the bill provides for exemption of the casual private carrier not engaged in the transportation business.

After discussing the motor and water carrier bills Mr. Eastman on February 27 took up the bill for the reorganization of the Interstate Commerce Commission and the creation of a permanent office of co-ordinator. He said he thought the railroads would profit by some degree of prodding and stimulus by the government and that "that was in fact, the genesis of the Association of American Railroads," and he pointed out that the co-ordinator would be able to consider the transportation problem with reference to all forms of carriers. Referring to the objections of those who approve the idea of having a co-ordinator but think he should have no power to issue orders he said that orders should be issued only as a last resort because action taken by unwilling carriers only in response to orders is not likely to be successful. However, he thought the power to issue orders should be available, although held in reserve, and said that he believed the railroads would be glad to have it in existence because they would have no other way of barring the operation of the anti-trust statutes and might desire its exercise in the case of a recalcitrant carrier.

Commissioner Frank McManamy, chairman of the legislative committee of the Interstate Commerce Commission, followed Mr. Eastman, making the same statement as to the motor carrier bill he had made before the House committee and also supporting the water carrier bill, saying that he would furnish a detailed statement as to that later but that what he had said about the other bill largely applied to it. He said that in his opinion the bus and truck bill does not represent new legislation so much as an effort to stop a gap in existing regulation by the states, which now regulate about 80 per cent of the highway traffic. He said that four out of five of the trucks encountered on the roads are regulated but that the fifth unregulated truck is more liable to be operated by the larger companies of truck operators than the others. A statement in opposition to S. 1635 repeated the argument made by the commission in its letter transmitting the co-ordinator's report and also included the following:

The co-ordinator's proposed reorganization appears to be built around, first, a permanent chairman who will assign the work to the various divisions and members of the commission and perform all of the administrative duties of the commission and what he terms a control board of six members to be composed of the chairman of the commission, the co-ordinator, and the chairmen of each of the divisions of the commission. A serious objection to this is that when the control board is hearing argument or is in conference, the work of the entire commission will be crippled because the most important member of each division, namely the chairman, is on the control board.

The control board is apparently created for the purpose of decreasing the number which will pass upon matters which, on petition, are appealed to the commission from the various divisions. There may be merit in this provided it would be acceptable to the shippers, the railroads, and others who have occasion to appear before us. But it is not necessary to change the entire organization of the commission in order to bring this about. The same thing could be accomplished by the following slight amendments to sections 16a and 17 of the act:

Add to Section 16a of the Act:

"For the purpose of this section, the Commission may create one or more appellate divisions, each to consist of five or more members of the Commission designated by it, and may by general order or by special orders assign applications for rehearings generally or in particular cases or in particular classes of cases to one of such appellate divisions for consideration, decision and action thereon, and any action by an appellate division in any matter so assigned to it, whether upon the application for rehearing or in any subsequent proceedings, shall have the same force and effect, and may be made, evidenced, and enforced, and have the same degree of finality, as if made or taken by the Commission; but this shall not be deemed to divest the Commission of any of its powers, and applications for rehearing of decisions, orders, or requirements made by the entire Commission shall be considered and determined by the entire Commission."

Section 17 (2): Amend second sentence to read:

"Such divisions shall be denominated, respectively, division one, division two, and so forth, or may be designated by the Commission by a term descriptive of the principal subject, work, business, or function assigned or referred to such divisions under the provisions of this section."

Section 17 (4), second sentence, substitute for "subject to rehearing by the Commission" the following, "subject to rehearing by the Commission or by an appellate division thereof as provided in section 16a hereof, as the case may be," and strike the remainder of the sentence.

Section 17 (6):

In the first sentence, strike out the colon before *"Provided, however,"* and substitute a period, and strike the remainder of the sentence.

In the seventh sentence, strike the words "by the Commission," so the sentence will read, "Any action by a division upon such a petition shall itself be subject to reconsideration as provided in Section 16a of this Act and in paragraph (4) of this section."

Among the duties assigned to the permanent chairman will be an attempt to co-ordinate and harmonize the various divisions which due to the statutory assignment of duties are in fact within themselves small commissions and also to perform all of the administrative duties which under our present organization are divided amongst 11 commissioners.

The question of assigning to the chairman all administrative matters handled by the commission has serious drawbacks. At the present time these administrative duties are divided amongst the 11 commissioners, therefore no commissioner is burdened with them, and they can be handled with much greater dispatch. Experience has proven that by selecting commissioners who are especially qualified either by previous training or by study to handle certain administrative duties, they can be performed much better than assigning them all to the chairman. For instance, amongst our important administrative duties is the supervision of our Bureau of Finance. Ever since this work has been assigned to the commission it has been under the direction of the senior member of the commission who has given it personal attention. No man can be found either in or outside the commission who is better qualified to handle this work, therefore nothing would be gained and much would probably be lost by assigning these administrative duties to the chairman.

The proposed organization is patterned somewhat after the present organization of the commission, that is, divisions are created to handle special work as at present. There is, however, this important difference. Organizations of divisions by the commission is authorized by law and divisions are created to meet present needs and may be changed at will to take care of additional duties which may be imposed by the Congress or any special situations which may arise. By leaving the assignment to divisions with the commission, members who are free to serve on such divisions can be assigned and can be changed at will to meet the needs of the service. At present each member of the commission serves on two or more divisions. Under the proposed plan the work would not be equally divided and the number of divisions would be decreased. For instance, all matters relating to railroads would be assigned to one division of five members; while at present we have four divisions which handle railroad rates and other divisions which handle other matters as they come up. Under this plan it is possible on short

notice and without statutory action to change our form of organization to meet any emergency which may arise. Certainly a flexible organization can function with greater efficiency and economy than one established by statute which can only be changed by the Congress.

Senator Wheeler announced that representatives of the state commissions, the bus and truck operators, and the shippers would be heard on the motor bill before testimony is heard on the other bills.

Hearings Before House Sub-Committee

Hearings on H.R. 5262, the motor carrier bill, introduced by Representative Huddleston, which were begun on February 19 before a sub-committee headed by him, have been continued. R. V. Fletcher, general counsel of the Association of American Railroads, made a brief statement on February 22, expressing the opinion that H.R. 6836, the Rayburn bill, on which hearings were held last year, was in some of its aspects a better bill than the new one recommended by Co-ordinator Eastman. He said the sole purpose of his appearance on behalf of the railroads was to urge adoption of a policy providing for equality of regulation as between competing forms of transportation, at least so far as the nature of the business permitted application of the same type and character of regulation, and that no one charged with responsibility in the railroad world desired to deprive the public of motor transportation if it were the most economical form of transportation.

If the railroad competitors are not to be regulated, Mr. Fletcher said, the railroads would like to be freed of some of the present regulative restrictions in accordance with specific recommendations they have made. As to the proposal that bus and truck regulation be provided for in separate bills, Mr. Fletcher said he was apprehensive that if the matter were to be handled in this way Congress might pass the bus bill, say it had done enough for one session, and pass over until another session the important question of regulating freight carriers.

S. A. Maginnis testified on behalf of the American Short Line Railroad Association in support of the bill with some amendments. George L. Phillips, chairman of the National Advisory Council of the Railroad Employees' and Taxpayers' Associations, appeared in support of the bill. J. E. Benton, general solicitor of the National Association of Railroad and Utilities Commissioners, discussed certain amendments to the Eastman bill desired by the state commissioners. Ivan Bowen, counsel for the National Association of Motor Bus Operators, objected to several features of the bill and expressed preference for another simpler bill introduced by Representative Huddleston, H.R. 6016.

Truck Industry Opposes Some Features

Representatives of the American Trucking Associations, Inc., who appeared before the sub-committee on February 25, H. D. Horton, H. S. Schertz and E. S. Brashears, said they were in favor of "fair" federal regulation, but at the same time they opposed numerous features of the Eastman bill.

"From our experience with the administration of state regulatory laws," Mr. Horton declared, "we believe that much of the detail of the regulatory plan submitted in this bill is unworkable and unsuitable or will result otherwise in harming our industry, but we do believe fair legislation in the public interest can be devised and should be passed by Congress. We are ready to assist in every way possible to bring about a workable and fair type of federal regulation of our business."

He urged that the benefits of "self-regulation" under the code, which in one year of operation has succeeded in organizing about 190,000 truck operators, be preserved and continued.

Expressing the opinion that the Eastman bill could not be enforced on more than a small percentage of the industry, he declared regulation can be administered effectively only if the federal government machinery is adapted to the peculiar problems of the industry, and the industry harnessed to co-operate. He also asked that no means of escaping regulation be afforded to any types of for-hire operation.

Mr. Horton explained that, under its code, the trucking industry has been able to gather accurate and comprehensive facts on trucking for the first time in its history. He presented a number of charts and tables showing the scope and character of for-hire trucking operations. One chart showed there was an average of 1.6 vehicles per operator; another that 82 per cent of for-hire vehicles are driven by their owners; another showed that 82 per cent of the for-hire vehicles are operated in only one state. Common carrier vehicles, according to his figures, comprise about 16.5 per cent of all trucks for-hire, and contract carriers about 20 per cent. The remainder are included in the anywhere for-hire local cartage, commodity carrier and mixed operations groups.

Only about 2 per cent of all trucks, according to another chart, would be subject to federal regulation. Other compilations were offered showing one-way distances traveled by trucks.

Mr. Horton said he could not see how the state commissions could be expected to co-operate effectively with the federal government in obtaining enforcement.

He attacked the joint rate provision of the bill, which, he said, "makes it compulsory that the truckman enter into joint rates with the rails." "If this provision were left in the bill," he commented, "a highway carrier could be put out of business long before the commission had found out what had happened."

Mr. Horton concluded with an attack on that provision of the bill which exempts "the casual or occasional transportation of persons or property in interstate or foreign commerce for compensation by any person not regularly engaged in transportation by motor vehicle as his or its principal occupation or business." "These persons," he said, "could easily transport all of the property now handled by for-hire carriers and still individually come within the exemption. By carrying on this service for one or two days each week, the private carriers of the country could practically wipe out the carriers who would otherwise be subject to this bill."

Chamber of Commerce of U. S.

Prompt enactment of legislation for federal regulation of the principal agencies of transportation, including regulation of motor carriers along the general lines of the Huddleston bill, was advocated on February 27 by the Chamber of Commerce of the United States. The Chamber's position was presented by C. E. Bockus, president, Clinchfield Coal Corporation, and Colonel E. George Butler, manufacturer, Savannah, Ga. "In some particulars," it was pointed out, "the pending bill goes beyond the Chamber's position and contains numerous details on which as yet the Chamber has not taken action. In the main features of the bill, however, the suggested legislation has been endorsed by an overwhelming majority of Chamber membership by referendum. In advocating legislation for the regulation of both motor and water carriers it is desired to make clear that the Chamber believes legislation of this will promote a healthier condition among such carriers and that it is decidedly to their interest as well as to the interest of

the general public. The practical unanimity of the vote in the Chamber's referendum as to the desirability of this legislation is most impressive in the judgment of the average impartial business man. Finally, it is the wish to emphasize the importance of action on these long standing issues without further delay. Having such matters unsettled for long periods is most detrimental both to the transportation agencies and to the general public."

Transportation Conference Urges Unified Regulation

The Transportation Conference, organized in 1933 under the chairmanship of Harry A. Wheeler, president of the Railway Business Association, and composed of representatives of 15 organizations of the furnishers and users of transportation, was reconvened in Washington on February 26 and 27 pursuant to action taken when the conference reported its conclusions in March, 1934. After a day and a half of discussion of the bills proposed by Co-ordinator Eastman the conference reaffirmed some of the principal conclusions reached in its report of last year, including a declaration that the regulation of the rates and service of all interstate carriers which are or may hereafter be subjected to such regulation should be unified under the jurisdiction and control of the Interstate Commerce Commission. Mr. Wheeler appeared before the Huddleston sub-committee on Wednesday afternoon with a statement of the views of the conference. The position in favor of unified regulation by the I. C. C. was expressed by a unanimous vote of the conferees with one reservation because the position of one of the constituent organizations was to be determined at a special committee meeting later in the week. Most of the time was devoted to a discussion of the motor and water carrier bills and the conference voted to accept the classification of motor carriers included in the Eastman bill, which contains separate provisions for common carriers and contract carriers, omitting its own separate definition for "anywhere-for-hire" carriers.

There was some discussion of a proposal for legislation providing for the creation of an advisory council to express recommendations on transportation to the President, the Interstate Commerce Commission, and Congress, to be appointed by the President from panels nominated by various organizations interested in transportation together with public representatives selected by the President. There were several expressions in favor of such a plan but it was decided to refer the question to the constituent bodies in a referendum and it was hoped that a conclusion might be reached in time to go on record before the Congressional committees. No specific conclusion was expressed regarding the Eastman proposal for a reorganization of the Interstate Commerce Commission. The conference adjourned subject to call at any time the chairman and the executive committee consider it necessary.

THE LONDON, MIDLAND & SCOTTISH of Great Britain plans, for the 1935 vacation season, a wide extension of the "camp coach" or "caravan coach" facilities which it has offered to vacationists during the past few years. The plan involves the placing on sidings, in suitable vacation areas, of railway coaches which have been taken out of regular service and fitted up for use as camps. Each coach has been rebuilt with accommodations for six people, including two bedrooms, a living room and a kitchen. Complete equipment for housekeeping is also provided and the coaches are rented to vacationists at moderate weekly rates on condition that at least four railroad tickets be purchased to and from the location where the "camp coach" is placed.

Railroad Views of R. F. C. Chairman

(Continued from page 333)

tions, and we may, where it appears advisable, lend for maintenance and to buy equipment. We can buy railroad securities for the account of an obligated road, if a good purpose will be served, but this particular authority will be used with great discretion.

Lending to railroads is a small part of R.F.C. activities, but to the extent authorized by Congress, we want to help railroads to help themselves.

I believe that I express a rather general feeling in saying that railroad management has not been as farsighted and as energetic as it might have been in meeting the growing highway competition by improving service, by instituting economies in operation through pooling, coordination, and consolidation, and by a greater use of trucks, busses, and highways.

To what extent this is actually true, I am not prepared to say, but the point I want to make is that those roads which must come to the government for financial assistance, now that we are through the emergency period, must be prepared to prove their cases in point of management, competitive conditions, and policy in the above respects.

While the Congress has given the R.F.C. rather broad powers in lending to railroads, our directors have no intention of dishing out loans without a thorough study of all matters affecting the roads. We want to lend where a good purpose will be served and the loans can be properly secured.

Banker Control Criticised

As far as we are able to, we should like to assist railroads in getting cheaper interest rates, and to make them more independent of bankers. Banker control is naturally inclined to be restrictive. An officer or director of a railroad should have no pecuniary interest, direct or indirect, in the sale or flotation of the road's securities. The primary interest of a banker in serving as a director of a railroad, when stripped naked, is to make money out of the banking or financing of the road. Many of our railroad executives and operating heads are required to spend entirely too much of their time traveling to and from New York to get orders from their bankers. I am aware that railroads must have money, and that it is gotten through the sale of securities, as a rule by bankers, and that the bankers want representation on the railroad boards. The trouble is that ordinarily it is not representation they seek, but actual control by holding the purse strings.

We have gone through five very trying years and the test has been severe, not only to individuals, but to the body politic as a whole, and if we would serve our country and the generations to follow, we should do everything within our power to avoid another such experience. Certainly traffic and transportation contributed no more to this trouble than any other phase or our economics, and I have no thought of laying more than a proper share of the blame at their doors. But if I could do so, I would impress upon everyone, the necessity for putting order into the most vital of all businesses—traffic and transportation.

Conditions everywhere are improving, fear is gone, but capital is idle, and men out of work want work. Traffic and transportation, if given the opportunity through a Code of Fair Competition, can provide more of it than any other industry.

NEWS

House Water Carrier Bills Sent to Marine Committee

Had previously been referred to the committee on interstate and foreign commerce

The House of Representatives on February 26 approved a compromise agreement regarding the jurisdiction of its committees on interstate and foreign commerce and on merchant marine, radio, and fisheries under which the bill recommended by Co-ordinator Eastman for the regulation of water carrier transportation, H.R. 5379, which had been referred to the former committee, was re-referred to the merchant marine committee and hereafter all bills relating to or affecting transportation by water carriers are to be referred to the merchant marine committee. The name of the latter was changed to omit reference to radio and that subject is to be referred to the committee on interstate commerce, which has handled legislation relating to regulation of communications generally. The jurisdictional dispute between the committees had been the subject of several hearings before the rules committee. During the debate in the House there was some questioning as to the separation of jurisdiction over land and water transportation, at a time when co-ordination of transportation regulation is being urged, and some of those favoring the plan said that regulation of rates would remain with the committee on interstate commerce, although the bill which was re-referred includes rate regulation. Representative Rich, of Pennsylvania, referring to the competition of the Inland Waterways Corporation with the railways, said "it is high time that somebody in the federal government take action now and not at some future date to regulate all forms of transportation," and that he hoped the committee on interstate commerce would "give some consideration to regulation of all rates, whether it be by water, by rail, or on the highways."

Canadian Roads' Earnings Up in 1934

The Canadian Pacific in 1934 had net operating revenues totaling $24,384,023, an increase of $3,521,917 over the 1933 figure of $20,862,105, or 16.8 per cent. Gross revenues for the year rose by $11,273,266, to $125,542,954, while operating expenses rose by $7,751,349 to $101,158,931.

For the month of December, gross revenues were $10,705,780, an increase of $793,042 over December of 1933. The month's expenses at $7,534,371 were higher by $868,031, the result being net operating revenue of $3,171,408, a slight decline from last year's $3,246,397.

The Canadian National in 1934 had net operating revenues of $12,966,423 an increase of $7,259,239 over the previous year. Gross operating revenues during 1934 totaled $164,902,501, an increase of $16,382,759 over the revenues of 1933. Operating expenses were $151,936,078, an increase of $9,123,519.

In December operating revenues of the System totaled $13,354,480, an increase of $1,000,983 over December, 1933. Operating expenses increased by $395,633 to $12,040,004 in December, 1934, leaving net operating revenue of $1,314,476, an increase of $605,350 over the net of December, 1933.

Club Meetings

The Western Railway Club will hold its next meeting at Hotel Sherman, Chicago, on Monday evening, March 18. The subject before the meeting will be high-speed train operation, with the opening address by Elmer T. Howson, Western editor of the *Railway Age*. Other speakers will be W. F. Kane, signal engineer of the Burlington, and J. C. McCune, of the Westinghouse Air Brake Company.

The Southern and Southwestern Railway Club will hold its next meeting on Thursday, March 21, at 10 a. m., in the Ansley Hotel, Atlanta, Ga. F. S. Hasse, general manager, Oxweld Railroad Service Company, will present a paper on oxy-acetylene welding and cutting.

Southwest Shippers' Board

The Southwest Shippers' Advisory Board will hold its thirty-eighth regular meeting in San Antonio, Texas, on March 7. Robert S. Henry, assistant to the president of the Association of American Railroads, will be the principal speaker at a luncheon sponsored by the San Antonio Traffic Club, while Olin C. Castle, director, Car Pooling Section, Federal Co-ordinator of Transportation, will address the afternoon session. F. A. Leffingwell, secretary of the Southwestern Industrial Traffic League, will, as chairman of a special committee, analyze Co-ordinator Eastman's report and recommendations. An open discussion on these two subjects will be had so that members can voice their opinion on the proposed legislation, on the six-hour day for industries and railroads, on the full crew law and on train limits.

On March 6, the executive committee of the board will meet in joint session with members of the Southwestern Industrial Traffic League, the Texas Industrial Traffic League and the railroad contact committee. A meeting of the joint freight claim prevention committee of the board also will be held on March 6.

Grade Crossing Projects Reported to P. W. A.

Total of 2,296 included in national inventory of available public works, Ickes reveals

A total of 2,296 grade crossing elimination projects, the total cost of which is estimated at $333,756,593, is included in a national inventory of available public works projects being made by the Public Works Administration, Administrator Ickes announced on February 24. Nearly 60,000 projects of various kinds at an estimated cost of $8,500,000,000 have been listed by P.W.A. state engineers and state planning boards, according to the statement, although the inventory was not to be completed until March 1. The reports received are preliminary and subject to revision and they are for the most part in addition to more than $3,000,000,000 of projects filed with the P.W.A. prior to February 29, 1934, which have not received allotments. The survey was ordered by Administrator Ickes several weeks ago to obtain up-to-date information as to available projects which might be useful in connection with the President's program for work-relief and the development of natural resources.

The work-relief bill, carrying an appropriation of $4,000,000,000 for such projects, was passed by the House some time ago but has encountered many controversies in the Senate, which on February 22 recommitted the bill to the committee on appropriations, after having the day before adopted an amendment to the bill requiring the payment of "prevailing wages" on the work provided for. It was stated by Administration leaders that if passed in that form the bill would be vetoed by the President, who had proposed that the wages paid be somewhat less than those paid for private employment. It is said to be the intention to allow the bill to rest in committee for a time with the idea that protests will be made from various sections of the country that are interested in public works projects.

Bills in Congress

Representative Lea, of California, has introduced a bill, H. R. 5844, to encourage travel to and within the United States through the establishment of a tourist travel division in the Department of Commerce.

Senator Copeland, of New York, has introduced a bill, S. 2017, to provide for the regulation of the speed of buses and trucks engaged in interstate commerce.

Would Replace Transport Field's Chaos with Order

Dunn sees uniform regulation as aid to profitable operations for all classes of carriers

"There can be no full restoration of prosperity in this country unless prosperity is restored in the transportation industry, and there can be no prosperity in any branch of the transportation industry until order replaces chaos within it and enables every class of carriers to render well and with reasonable profit the kinds of service it is economically best fitted to render," said Samuel O. Dunn, editor of the *Railway Age* and chairman of the Simmons-Boardman Publishing Company, in an address to the Mattoon (Ill.) Chamber of Commerce on February 21.

"The transportation industry consists of all carriers, including especially those operating by rail, highway, water and air. Its importance in any constructive program of recovery is enormous because of its vast investment, the magnitude of its service, and its potential earning, employing and buying capacity. The cost of its service to the public is greatly inflated at present because it is over-developed in some respects and under-developed in others. At the same time its employing and buying capacity are entirely inadequate because almost all branches of it are being operated at a heavy loss. Only by establishing some order and stability in the industry can it be made profitable. Only by making it profitable can its buying power be adequately increased, because the bulk of its purchases from other industries must be made, directly or indirectly, from its profits. In the aggregate it is much the largest customer of the capital goods industries, which are the key to our entire present economic situation; and therefore these industries cannot be more than partially revived without increased buying from them by the transportation industry.

"Many persons believe the objective of railroad policy is to destroy all transportation by highway, water and air. Nothing could be farther from the truth. The railroads themselves are among the largest operators of buses and trucks. The number of trucks used by them increased from 900 in 1925 to 10,000 in 1931 and to more than 25,000 in 1934; and subsidiary companies partly or wholly owned by the railways operated in 1934 about 23,000 additional trucks. Many railways are increasing their use of trucks for short distances between cities, for terminal service and for store-door collection and delivery. They would increase it much more rapidly if their earnings made it possible to buy more, and if stable conditions in transportation were established which would enable them intelligently to anticipate future developments. The railroads are, in fact, today the largest potential market for trucks in the country, as well as a huge potential market for improved equipment for operation upon their tracks and for materials and supplies of innumerable kinds used in the improvement and maintenance of their permanent structures; but this enormous potential market can be converted into a real market only by establishing order in transportation and enabling the railways to convert their present heavy losses into profits and buying power.

"One important reason for the present instability and uncertainty in every branch of the transportation industry is lack of regulation which permits 'fly-by-night' carriers by both highway and water to invade the fields of carriers rendering regular rail, highway or water service, get business by cutting rates and causing demoralization, and then depart for some other territory to work havoc in the same way there. Most carriers rendering regular service, whether by rail, highway or water, as well as all competent students of business and economics, agree that regulation of all carriers to stop these piratical practices and the unfair discriminations they cause, is necessary in the interest of the entire legitimate transportation industry and the public.

"Co-ordination in transportation is greatly needed, but to be of benefit to all legitimate carriers and the public it must be established on a sound economic basis. This means that each class of carriers must be given opportunity to render the service it is best fitted for and required to render it without imposing any burden upon the taxpaying public. The accomplishment of this objective requires comparable regulation of all carriers and the withdrawal of all subsidies. It is the objective of the federal transportation legislation recommended by Co-ordinator of Transportation Eastman and now before Congress. Its attainment will result in reductions of present duplications of facilities and service both by the railways themselves and by them and other carriers, and reduce the total cost of transportation to the public. It will make possible reasonable profits for every kind of carrier rendering service for which it is economically fitted. It will thereby make possible a large increase of buying by the transportation industry as a whole from other industries and increases of business and employment in communities, large and small, throughout the country.

"Because of reduced railway earnings there are now about 700,000 former railway employes out of work, and, in addition, probably another 700,000 persons out of work who would be employed in other industries if the ability of the railways to buy from these other industries were restored. But there is only one way adequately to increase the ability of the railways and other carriers to increase their aggregate purchases from other industries, and this is to adopt measures that will put all carriers that have an economic justification for existence on a profit basis by eliminating those that can exist now only by practising every form of 'chiseling,' unfair discrimination and demoralizing piracy."

Rail-Lake-Rail Rates Postponed

The Interstate Commerce Commission on February 21 announced a postponement, on petition of the railroads concerned, of the effective date of its recent order prescribing a revision of class rates via rail-lake-rail routes, from March 20 to July 20.

Mediation Board Orders New Election on A. C. L.

Vote to determine representatives of shop employees will this time be taken by crafts

The National Mediation Board, whose services were invoked by the Railway Employees' Department of the American Federation of Labor to determine the representatives of the shop employees of the Atlantic Coast Line in accordance with the requirements of the railway labor act, has ordered that another election shall be held in which the vote will be taken by crafts. An election was held at the order of the board at various points on the system from September 11 to 21, 1934, and the result was appointed by the mediator as having been in favor of the Shopmen's Association of the Atlantic Coast Line Railroad, but protests were filed charging violations of the law by representatives and agents of the company and certain alleged influences of management permitted by the mediator in the course of the election. After holding hearings on the protests the board finds:

(1) that the election on the Northern division was not properly conducted;

(2) that at least at one point on the Southern division influence by an agent or officer of the company was exerted upon some of the employees;

(3) that generally suspicion was raised in the minds of many employees that the ballot was not secret; and

(4) that the full and free choices of a large number of the employees were not expressed in the election that was held in September.

"The vote was taken by the shop forces as a whole and not by crafts," the report says. "There are employed a large number of negro laborers that are not assigned to any of the crafts. Prior to the election the negroes were not admitted to membership in the Shopmen's Association and so for many years have been without representation. One result of this situation was the discrimination in the matter of the 2-cent per hour differential heretofore discussed that has only been removed through the attention called to it by the hearings of the board. We have previously called attention to the large number of ballots that were deliberately nullified by marking an X in the blank space on the ballot.

"Obviously if the negro laborers voted for no representation or refused to vote in an election participated in by the whole shop forces, the result would be to deprive the crafts in which the white mechanics predominated of any representation. For this reason, also, the conduct of the election was unsound."

Mediators will be assigned to conduct such election at the earliest possible date. The board will prepare the rules of election and the ballots, and they will be duly posted for the information of all concerned. A copy of the board's report and order will be served upon the parties to the dispute and upon the carrier.

Freight Car Construction Studies by Eastman Staff

Co-ordinator submits several cost statements compiled by Section of Car Pooling

Co-ordinator Eastman on February 25 addressed to the president of the Class I railroads a letter accompanied by several statements relating to freight car construction costs, compiled by his Section of Car Pooling, which, he said, represent in a sense a by-product of studies which the section has been making of various phases of the freight car question. In connection with its survey of the situation the section has prepared and distributed heretofore six studies. Study No. 7, according to the memorandum by O. C. Castle, director of the section, deals principally with freight car costs, together with information as to the quantity, type, weight and capacity of cars built in the past, as well as those now being built. This study, which is in the form of graphic charts, presents data for 21 types of cars. An explanatory text accompanies the charts. Attached to this study are the following:

(1) Statement "A" showing gross expenditures for additions and betterments to railway property. This statement is based on reports to the Bureau of Railway Economics by Class I carriers, excluding switching and terminal companies. During the twelve-year period 1922-1933 inclusive, the gross expenditures on freight train cars totaled $1,987,701,000, this amount being 58.1 per cent of the total expenditures on equipment betterments and 25.4 per cent of the grand total additions and betterments charges. The gross expenditures for the freight train car account in the period shown exceeded those of any other account.

(2) Statement "B" showing the relative importance of various road and equipment accounts. The "Railroad Construction Indices" issued by the Interstate Commerce Commission, Bureau of Valuation, on January 19, 1934, have been arranged in descending order according to rank for the 15 accounts having the highest percentages. It will be noted that freight train cars rank second, being exceeded only by grading. The 15 accounts shown contain about 90 per cent of the total railroad property.

(3) Chart "A", showing the number of freight train cars installed and retired from the service of Class I steam railways from 1907 to 1933, inclusive, as reported by the Interstate Commerce Commission, Bureau of Statistics.

(4) Chart "B", showing domestic freight car orders for the years 1901-1934 inclusive, as reported in annual editions of the *Railway Age*.

(5) Two charts, "C" and "D", showing the number of freight cars ordered and delivered in each month from January, 1926, to December, 1934. The charts show that orders have generally been placed in the few months at the beginning and end of the year and that deliveries have generally been made in the spring and summer months. The high peaks and deep valleys in these charts accentuate the need for greater coordination of equipment purchases. Stabilization of car building would prove beneficial to carriers, car builders and the public.

(6) Chart "E", showing the freight cars owned, car surplus and cars awaiting repairs during the years 1923 to 1933 inclusive. The source is data prepared by the Car Service Division, Association of American Railroads, and the *Railway Age*.

"These statements and charts," he said, "reflect past and present practices with respect to freight car costs and price ranges, quantities purchased, variations in weights and capacities, the number of cars installed and retired and data bearing on surplus cars and cars held for repairs. The information should be of value in the development of plans for the immediate and future improvements in transportation.

"For example, the comparison of car costs emphasizes the need for co-ordination and stabilization of car construction, better standardization of equipment and a more scientific and equitable basis for car hire payments than is provided in the present per diem rules agreement. The data will also be useful in working out the details for appraisal of units included in the operation of a car pool.

"The statements relating to freight cars which we have previously distributed were designed to aid the railroads in their studies of these matters. That many roads have made use of the data is evidenced by supplementary studies made by individual roads and the advices we have received of changes in their equipment programs. The present study is submitted as a contribution to the available information on this general subject in the hope that railroad officers may find it helpful."

Steam Railway Accident Statistics November, 1934

The Interstate Commerce Commission's completed statistics of steam railway accidents for the month of November, now in preparation for the printer, will show:

Item	Month of November 1934	1933	11 Months ended with November 1934	1933
Number of train accidents:				
Total	458	506	5,491	5,078
(At highway grade crossings, included in total)	18	6	147	116
Number of casualties in train, train-service and nontrain accidents.				
Trespassers:				
Killed	167	189	2,504	2,632
Injured	197	238	2,992	3,799
Passengers on trains:				
Killed	1	2	27	37
Injured	137	306	1,660	1,773
Employees on duty:				
Killed	43	40	477	443
Injured	1,339	1,338	15,511	14,190
All other nontrespassers:*				
Killed	178	171	1,484	1,476
Injured	630	697	5,861	5,288
Total—All classes of persons:				
Killed	389	402	4,492	4,588
Injured	2,303	2,579	26,024	25,050

* Casualties to "Other nontrespassers" happen chiefly at highway grade crossings. Total highway grade-crossing casualties *for all classes of persons, including both trespassers and nontrespassers,* were as follows:

Killed	168	164	1,377	1,340
Injured	438	488	3,775	3,246

Canada's Railway Minister Would Fire C. N. Auditors

Opposition attributes move to firm's recommendation that road's debt be reduced

Considerable political turmoil developed in Parliament at Ottawa last week when Hon. Dr. R. J. Manion, Minister of Railways, introduced a bill to dismiss the firm of chartered accountants, George A. Touche & Co., which has been auditing the accounts of the Canadian National, and give the job to another firm. This action was construed by the opposition as a sign of displeasure at the action of the Touche firm in recommending a scaling down of the C. N. R. capital structure.

This interpretation was emphatically denied by Dr. Manion in the course of the debate. He declared that no audit firm should have a "strangle hold" on the job and that the only reason the change was being made was that it was felt the Touche company had had the work long enough and that another firm should be given a chance.

Two Ontario Liberal members, Hon. W. D. Euler and Ross W. Gray, strongly urged the adoption of the recommendations of the Touche company in its report to the Government that there be a substantial write-down in the road's debt, and both declared that no very good reason had been offered by the Minister for making a change in the auditors. Mr. Euler contended it was unfair to the railway and to the principle of public ownership that the reports of the railway should be burdened with figures representing debt that would never be repaid and the interest on which would never be paid. Mr. Gray charged that to refuse to rectify the capital structure constituted a failure to present the position of the road fairly to the public.

Briefly reviewing the agitation for a write-down of the road's capital structure the Minister recalled that in 1921 Sir Joseph Flavelle urged this move in a letter to the then Premier, Rt. Hon. Arthur Meighen. Dr. Manion commented that it would be just as reasonable to suggest that Sir Joseph was dropped from the Grand Trunk board because he urged a write-down as it would be to suggest, as had been done in newspaper articles last week, that the Touche company was "fired" for recommending a recasting of the capital set-up.

The Minister proceeded to show that during many years of his regime the late Sir Henry Thornton urged a similar move. "The late government," he said, "did not see fit to make any change and so far this government has not seen fit to make a change. As a matter of fact legislation would be necessary to effect such a change. We would have to get the authority of the House to wipe out some of the stocks. In view of the fact that it does not make one particle of difference to the earnings of the Canadian National it is not, in my view, a live question at all.

"Unless we wiped out nearly $1,500,000,000 charged up on the books of the company and in addition charged up to the

people of Canada some of the bonded indebtedness owing to the bondholders in the United States, Britain and Canada, you would have no need whatsoever to change the capital set-up. Since not one cent of any of the government debt has been paid back and not one cent of interest has been paid upon it and since the Canadian people are today paying nearly all of the interest owing by the Canadian National to the bondholders, there is no method in the world at the moment whereby by writing down the capitalization of the road you could have any effect whatever on the Canadian National."

Dr. Manion concluded by declaring that the proposed change in auditors was no reflection on the Touche company, but he did say that since the proposal to make the change had become known a lively propaganda had been conducted against it and he had been told this propaganda had been instigated by the Touche company. He could not believe this was true, but if it were true then the government had waited too long to make the change. He hoped that the Touche company could prove they had no hand in it, "although I must say that some of the material used in the press and discussed in this House looked to me as if it could only come from the auditors."

Mr. Euler thought the government had not presented adequate reasons for making the change in auditors. If it were true the government felt that the auditors should be changed every two years then "it seems strange they waited four years to make a change." He regretted the House Committee on National Railways and Shipping had little time last session to discuss the report of the Touche company on the question of capitalization and he hoped that this session more time would be given and that the auditors would be present to explain their report to the committee. Dr. Manion assured him this would be done.

"For a good many years," continued Mr. Euler, "in this House and outside of it, it has been urged that something should be done to place the capitalization of the National Railways on a fair basis, a basis such as would make it impossible for the enemies of the publicly-owned system to misrepresent the position of those lines. I have urged it many times but it was never done. The Minister says that Sir Henry Thornton made a certain suggestion to the previous government. My impression is that no really definite or concrete suggestion was ever made for the writing down of the capital structure. The railways were never quite ready to do it, and one of the reasons was that it was extremely difficult because the national system consisted of an aggregation of about 100 joint stock companies with their various bond issues.

"We have not had a fair picture of the situation of the Canadian National. It is bad enough and during the present year we shall still fall short of paying interest on the bonded indebtedness to the public by about $50,000,000. But when you figure that according to the Canadian National books there is still owing by the railways an additional $1,770,000,000, then the people are almost justified in figuring interest on that $1,770,000,000 (the debt of the railways to the government), and it is very easy then to put the deficit of the Canadian National at upwards of $100,000,000. It is not fair to carry on the books of the railway that sum of $1,770,000,000 owing to the government."

Mr. Euler then read from the auditors' report to show the items making up the total of $1,770,000,000. They are as follows: Old Grand Trunk, $165,000,000; Canadian Northern Railway, $100,000,000; Old Grand Trunk debentures, $15,000,000; Government advances for deficits, $324,000,000; Government loans for capital purposes, $337,000,000; Interest accrued by railways on government advances and loans, $424,000,000; and Government expenditures on Canadian Government Railways (the Intercolonial), $404,000,000.

Turning to the recommendations of the auditors "to correct misconceptions of Canada's financial position," Mr. Euler quoted the auditors as suggesting that the old Grand Trunk liability of $165,000,000 should be written off completely, because the board of arbitration in 1921 declared the stock to be worthless and the intrinsic property investment values substantially overstated. The next recommendation was that the $100,000,000 of Canadian Northern stock be written down to $18,000,000, using the findings of the arbitration board of 1918 as the basis for this reduction. Thirdly, the auditors, Mr. Euler told the House, urged the complete writing off of the $324,000,000 of government assurance for deficits, "because it represents nothing but a contribution by the shareholders to replace their impaired capital."

As to the two remaining items, namely the $337,000,000 for capital purposes and the $404,000,000 spent on the Intercolonial the auditors, said Mr. Euler, suggested that instead of carrying these as an ordinary liability by the Canadian National Railways there should be issued to the Government of Canada $760,000,000 in common stock upon which no interest would be paid."

"If these recommendations were carried out," commented Mr. Euler, "there would be this situation, according to the auditors: Items now totaling $1,011,000,000 would disappear entirely from the railway company's account with the Dominion of Canada and the remaining $760,000,000 would appear not as a debt owed by the railways, as a debtor, to the government, as a creditor, but as an investment by the government, and it would be subject to the ordinary risks of business. If there were a profit the government would get a dividend, and if there were a loss it would not be carried on the books as a liability of the company for all time to come."

Reminding the House of what the Prime Minister said over the radio on January 2 to the effect that the return to prosperity depended upon the solution of the railway problem Mr. Gray declared that the Prime Minister "left it at that" and did not explain what he meant in any of the succeeding radio speeches. Then before the Toronto Board of Trade the Prime Minister, according to Mr. Gray, stated that the solution of the railway problem was not a responsibility of the government but of the people. "By that statement," commented Mr. Gray, "he meant that it was a responsibility of the people to return him to power so that he could bring about the amalgamation of the two roads."

The bill was passed through committee of the whole and now stands for third reading. After a brief discussion third reading was given the measure introduced by Hon. E. N. Rhodes, Minister of Finance, to authorize the government to refund Canadian National obligations up to a total of $200,000,000. The Minister stated recently that probably $172,000,000 of this total would be refunded this year at lower interest rates, the saving in such charges to total about $2,500,000 annually.

S.E.C. to Accept I.C.C. Reports

The Securities and Exchange Commission has issued a ruling that reports of carriers filed with the Interstate Commerce Commission may be filed with it in place of reports required in the forms required under the securities and exchange act.

North Western Extends Winter Sports Tours

Because of the popularity of winter sports tours to the north woods of Wisconsin and the fact that there is now four or five feet of snow in this region, the Chicago & North Western has extended its winter sports week-end tours until March 8. Travel to that area during January and February has shown an increase of 50 per cent as compared with last year.

Annual Banquet of N. Y. Traffic Club

The twenty-eighth annual banquet of the Traffic Club of New York was held at the Hotel Commodore in that city on February 21. Jesse H. Jones, chairman of the Reconstruction Finance Corporation, was the principal speaker, and an abstract of his address is published elsewhere in this issue. Charles W. Braden, general traffic manager of the National Distillers Products Corporation and president of the club, presided at the meeting and brief extemporaneous remarks were made by Col. Henry W. Anderson, co-receiver of the Seaboard Air Line.

Tie Stocks Slightly Smaller

Reports filed with the Railway Tie Association by 14 companies which supply about 85 per cent of the crossties produced in America by commercial firms show that these companies had 6,671,608 crossties on hand on January 1, 1935. This was 184,272, or 2.7 per cent, less than were in stock on January 1, 1934, but 809,809, or 13.8 per cent, more than were on hand on January 1, 1933. The number in stock on January 1, 1935, showed a drop of 90,466, or 1.3 per cent, as compared with the previous month.

Of the ties available on January 1, 3,759,303, or 56.5 percent, were 8 ft. long, and 2,912,305, or 43.5 per cent, were 8 ft. 6 in. long, while 449,258, or 6.7 per cent, were U-ties for use untreated, 4,593,834, or 68.9 per cent, were oak ties for use untreated, and 1,628,516, or 24.4 per cent, were other species for treatment.

The largest quantity of ties in stock was reported by the district comprising the

states of Kentucky, Tennessee, Alabama, Mississippi and Louisiana (east of Mississippi river), the number of ties reported being 2,742,658, or 41 per cent of the total. The smallest number on hand was reported by the district which includes Michigan, Wisconsin and Minnesota. This district had 56,006 ties, or less than 1 per cent of the total, on hand on January 1.

Western Roads Ask Reconsideration of Grain Rate Case

Western railroads have petitioned the Interstate Commerce Commission for a vacation or postponement of its order of October 22 in the western grain rate case and for a rehearing and reconsideration of the case, on the ground that the effect of the order would be to reduce still further their inadequate revenues. "The theory underlying the rate structure prescribed," the petition says, "is, to start with, upon the use of a mileage scale so low in level that its employment as a standard in constructing rates on junk or some other such low grade commodity would be of doubtful propriety."

Veterans Federation Urges Action on Eastman Regulatory Program

The Society of Officers, United Associations of Railroad Veterans, at a recent meeting, adopted unanimously a resolution favoring the transportation regulation program recommended by Co-ordinator Eastman. The resolution states specifically that the organization favors proposals "to place buses, trucks, waterways, pipe lines and airplanes under strict Interstate Commerce Commission regulations, in the same manner that the railroads are now regulated."

It further urges that all officers of its affiliated veteran associations see that their respective members have a thorough understanding of the situation and that they be urged to promote the program with their Senators and Representatives.

American Statistical Association Holds Railroad Meeting

The "Future of the Railroads" was the general subject discussed by several speakers at a meeting of the American Statistical Association on February 28 in New York. Phases of this general topic and the speakers thereon were as follows: Railroads and the Public—Dr. George W. Edwards of the College of the City of New York; Railroads and their Competitors—Charles E. Smith, vice-president, New York, New Haven & Hartford; Railroads and the Investor—Milton W. Harrison, president, Security Owners Association; Railroads and the Government—Dr. Lewis C. Sorrell, secretary of the Transportation Conference of 1933-34. John M. Fitzgerald, vice-chairman of the Committee on Public Relations of the Eastern Railroads, presided.

Niagara (and Other) Falls

The cataract at Niagara, N. Y., falls because there is no way to get out of it, but the railroad trainman who falls off the roof of a car, because he had been sitting too near the edge, can only blame himself for not using his brain. This is the theme of circular S-435, of the Safety Section, A.A.R., which has been issued for the attention of safety committees during the current month. Under the head of "Falls of Persons," the Interstate Commerce Commission record for 1933 shows 88 trainmen killed by falls, simply because they failed to be sure of firm grip and safe foothold. And it appears that of all the fatal accidents to trainmen during the year, 42 per cent were due to falls; and of non-fatal injuries 37 per cent were due to that cause.

The circular is made up of an aggregation of short lectures on different causes of falling, illustrated by 19 carefully drawn pictures, showing typical situations.

P. W. A. Allotment for Dredging Little Calumet River

Allotment of $1,529,000 for dredging the Little Calumet river at Chicago has been announced by Public Works Administrator Harold L. Ickes. The allotment was made to the Army Corps of Engineers upon advice from the Secretary of War that the city of Chicago had complied with conditions precedent which were set forth by PWA when it was decided last year to undertake the improvements as a public works project. The first PWA allotment was $825,000 for three by-passes in the Sag Channel subject to local interests agreeing to alter three of the 20 bridges, the other 17 bridges to be altered later. The new allotment was predicated on a letter from the Secretary of War advising that the necessary easements have been obtained by the city of Chicago either by voluntary agreements or by condemnation proceedings.

The Worst Railroad Wreck

"Railroad Stories," a Munsey magazine, published in New York City, in an article printed in its January number, says that the worst wreck in the history of the world's railroads, measuring by the number of victims, occurred in France, during the World War, and that news of it was suppressed because of the fear of the disturbing influence on the soldiers, the army at that time—December, 1917—being in a desperate state of mind, with mutiny showing itself here and there.

The magazine article, referring first to the two worst wrecks on record—Gretna Green, Scotland, May 22, 1915, and Lagny, France, December 24, 1933, in which the total fatalities were respectively, 227 and 200—goes on to say that the detailed reports of the war-time disaster, never before made public in America, show that probably over 1,000 soldiers were on the wrecked train, and that the total number of killed was never exactly known.

Following the disastrous battle of Piave, about 1,200 soldiers were gathered at Modane, on the Franco-Italian frontier, to be carried home on Christmas leave. The train was so heavily loaded that the engineman refused to proceed on the steep descending mountain grade. Military government, however, was absolute and he was told, in substance, that refusal to take the train would incur the same penalty as treason. The brakes, however, in a short time ran hot and, after passing St. Michel, the whole train left the track on a sharp curve. Some of the cars took fire, apparently from heated brake shoes, and an estimated number of 400 men were burned to death. The most trustworthy total is 543 killed and 243 injured.

Depreciation Percentages Prescribed for Short Lines

Stating that 93 short-line railroads have not filed with it estimates of composite annual percentage rates of depreciation as required by its order of July 28, 1931, as amended, the Interstate Commerce Commission has issued an order providing that with the accounts for April, 1935, the listed carriers shall account for depreciation charges under the order by applying to the ledger value of equipment used in their operations, whether owned or leased, the following annual composite percenetage rates:

Account No.	*Name*	*Rate (%)*
51	Steam locomotives	3.25
52	Other locomotives	3.25
53	Freight-train cars	3.50
54	Passenger-train cars	2.75
56	Floating equipment	2.50
57	Work equipment	3.50
58	Miscellaneous equipment	12.00

The estimates were to have been filed by September 1, 1934, by an order of June 13, 1934, amending the uniform system of accounts for steam railroads, operating steam railroad companies were authorized, until rates are prescribed by the commission, to apply depreciation percentage rates developed in accordance with the instructions contained therein.

Minnesota Legislature Asks Repeal of Long-and-Short Haul Clause

A concurrent resolution, recently adopted by both branches of the Minnesota legislature and signed by the Governor, memoralizes Congress to eliminate the long-and-short haul clause from the fourth section of the Interstate Commerce Act, or, in lieu of such elimination, to so modify the clause as to permit railroads to establish rates which will enable middle west industries to meet the competition of eastern manufacturers transporting their freight through the Panama Canal. Similar action was taken by the Northwest Shippers Advisory Board at a recent meeting in St. Paul, Minn., while the St. Paul Association of Commerce has recently sent letters to members of the Senate committee on interstate commerce and the House committee on interstate and foreign commerce, and to middle-western senators and representatives asking support for the Pettingill bill (H. R. 3263), which measure is designed to effect the desired alteration of the fourth section.

The concurrent resolution passed by the Minnesota legislature sets forth, among other contentions, that "the middle west contributed by taxes to the construction of the Panama Canal and contributes to its maintenance and support and should be permitted to have a basis of rail rates which will prevent the Panama Canal from working an unjust discrimination against middle west industries and employment."

The St. Paul Association of Commerce letter, pointing out that the Pettingill bill

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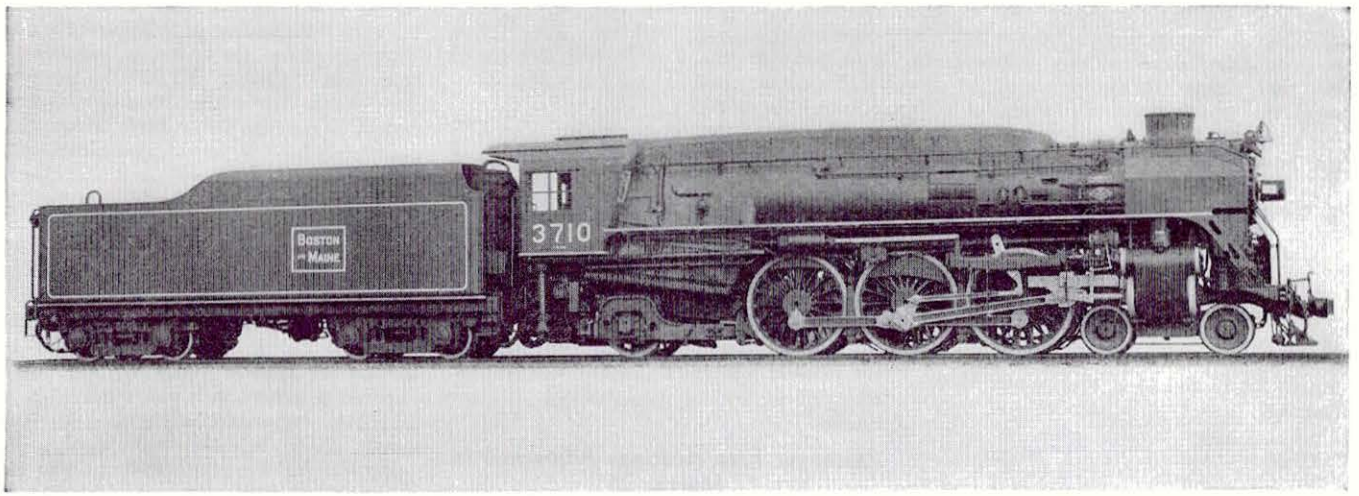
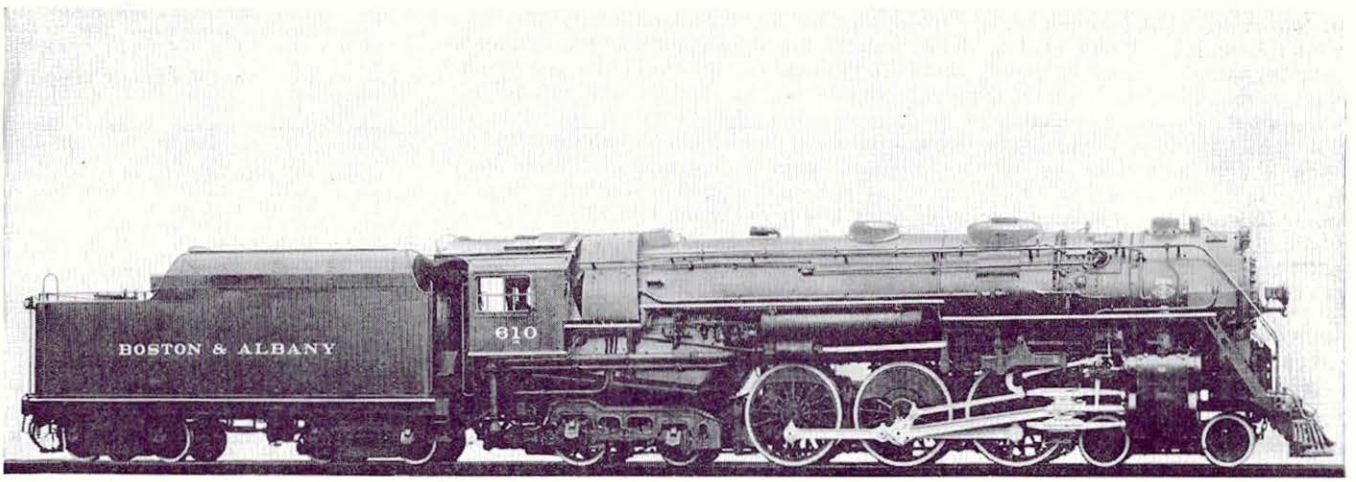


STEAM PASSENGER POWER is Highly Developed

Back of the Modern Super-Power Steam locomotive is a century of experience, continuous development and engineering progress.



LIMA LOCOMOTIVE WORKS INCORPORATED

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has wide support, including that of the National Industrial Traffic League and the railroad labor organizations, continues to say that "under the present rate adjustment the middle west manufacturer cannot compete . . . . and as a matter of fact the business which this market formerly enjoyed on the Pacific Coast has been lost to the seaboard manufacturer."

A.R.E.A. Convention Program

The following program has been announced for the thirty-sixth annual convention of the American Railway Engineering Association, which will be held on March 12, 13 and 14 at the Palmer House, Chicago:

Tuesday Morning, March 12

President's Address, John E. Armstrong, assistant chief engineer, Canadian Pacific.
Reports of secretary and treasurer.
Reports of Committees on:
Yards and Terminals.
Shops and Locomotive Terminals.
Water Service, Fire Protection and Sanitation.
Uniform General Contract Forms.
Electricity.

Tuesday Afternoon

Economics of Railway Operation.
Economics of Railway Labor.
Economics of Railway Location.
Maintenance of Way Work Equipment.

Wednesday Morning, March 13

Complete Roadway and Track.
Stresses in Railroad Track.
Rail.
Track.
Ties.

Wednesday Afternoon

Iron and Steel Structures.
Wooden Bridges and Trestles.
Masonry.
Economics of Bridges and Trestles.
Waterproofing of Railway Structures.

Thursday Morning, March 14

Roadways.
Highways
Waterways and Harbors.
Buildings.
Signals and Interlocking.

Thursday Afternoon

Standardization.
Wood Preservation.
Records and Accounts.
Rules and Organization.
Installation of Officers.
Closing Business.

The sessions will convene at 9 o'clock each morning and at 2 o'clock in the afternoon. They will adjourn at 4 p. m. on Tuesday and Wednesday to permit members to visit the exhibit of the National Railway Appliances Association at the Coliseum. As during the past three years, there will be a luncheon on Wednesday noon in lieu of the annual dinner of former years, at which William Baird, steamship passenger traffic manager of the Canadian Pacific, will speak on the "Steamship Outlook."

Cornwell Sees Government Ownership Leading Ultimately to Communism

Speaking on "Government Ownership or What?" before the Chamber of Commerce of Canton, Ohio, on February 27, John J. Cornwell, general counsel of the Baltimore & Ohio, declared that if government ownership of the railroads became effective in the United States it would mean socialism and ultimately lead to communism. Mr. Cornwell, discussing the government ownership bill prepared by Senator Wheeler, showed that no country in the world ever adopted government ownership as a deliberate or preferred policy. Foreign nations where it exists have it as a necessity, he said, and the Canadian people are burdened with an indebtedness of two and a quarter billion dollars because of their government-owned railroad. He added that every argument and every experience in this country and abroad are against government ownership.

Alluding to the recommendation of Co-ordinator Eastman that the position of Co-ordinator be continued with an extension of the powers of that official, Mr. Cornwell expressed opposition to continuing permanently a super-regulatory authority. He feels that with the regulation of the Interstate Commerce Commission, and of 48 state commissions, while the issuance of railroad securities is regulated now by the Federal Securities Commission, no further nor higher regulatory bureau is necessary.

Passenger Fare Hearings Adjourned to March 25

Hearings in connection with the Interstate Commerce Commission's investigation of railroad passenger fares were adjourned on February 20 to March 25, when time will be allowed the eastern railroads for rebuttal testimony. In the meantime the railroads are appealing to the commission from a ruling of Commissioner Porter overruling their motion to have stricken from the record statistical data included in the passenger traffic report prepared by Co-ordinator Eastman's Section of Transportation Service on the ground that it constituted privileged material furnished by the railroads to the co-ordinator. J. G. Daley, appearing for the United Commercial Travelers, testified that the 1½ cent a mile basis of coach fares should be adopted throughout the country, saying that rate had produced better results than the 2-cent rate.

The formal motion to strike from the record the testimony and exhibits presented by A. F. White, assistant director of the Section of Transportation Service, was filed with the commission on February 27. It pointed out that the report had not been approved by the co-ordinator, who had stated that he was holding his mind open with respect to its conclusions and recommendations, and also that the commission's investigation deals with the lawfulness of passenger fares and not with their lawfulness "under a theoretical or assumed basis or method of operation which may or may not be adopted in the future."

P.R.R. Spent $56,910,000 of P.W.A. Loan Funds in 1934

Wages paid and orders placed during 1934 by the Pennsylvania, under its electrification and improvement program financed by the Public Works Administration, totaled $56,910,000, the railroad recently announced. Of this sum, wages paid directly by the P. R. R. amounted to $10,194,000, and purchases from the equipment and supply industries to $46,716,000. A very large part of this latter sum, the statement pointed out, goes into wages paid the employees of suppliers and producers of materials in their various stages of processing, up to completion.

The direct wage payments by the railroad, chiefly to employees on furlough from regular service, included $8,400,000 for roadway electrification, $194,000 for electric locomotive construction at the Altoona (Pa.) works, and $1,600,000 for labor in the building of 7,000 freight cars.

Orders placed for materials, supplies and equipment included $11,000,000 for the New York-Washington roadway electrification, $8,300,000 for electric locomotives completely built by outside companies, $11,000,000 for materials and parts for electric locomotives built or assembled at the Altoona works, $12,600,000 for materials and supplies used in constructing the 7,000 freight cars, and $3,700,000, in round figures, for 100,000 tons of new steel rail.

Under the contract between the Government and the Pennsylvania, covering the advance of P.W.A. funds, the railroad is required to report each individual order or purchase, regardless of size. Approximately 25,000 separate items were so reported during the year, ranging from two purchases of four cents and one cent respectively, to such items as a single order of more than $5,000,000 for electric locomotive propulsion and control parts.

While the greater part of the New York-Washington electrification project has been completed and the line opened for through passenger service, approximately 9,500 men are still actively at work on the job, including those completing the roadway electrification system and men employed on electric locomotive construction at Altoona works. Hundreds of other men are working on electric locomotive parts and construction in the shops of the electrical and equipment companies.

Meetings & Conventions

The following list gives names of secretaries, date of next or regular meetings and places of meetings:

AIR BRAKE ASSOCIATION.—T. L. Burton, Room 3400, Empire State Bldg., New York, N. Y.

ALLIED RAILWAY SUPPLY ASSOCIATION.—F. W. Venton, Crane Company, 836 S. Michigan Ave., Chicago, Ill. To meet with Air Brake Association, Car Department Officers' Association, International Railroad Master Blacksmiths' Association, International Railway Fuel Association, International Railway General Foremen's Association, Master Boiler Makers' Association and the Traveling Engineers' Association.

AMERICAN ASSOCIATION OF FREIGHT TRAFFIC OFFICERS.—W. R. Curtis, F. T. R., M. & O. R. R., Chicago, Ill.

AMERICAN ASSOCIATION OF GENERAL BAGGAGE AGENTS.—E. L. Duncan, 816 McCormick Bldg., Chicago, Ill. Annual meeting, September 17, 1935, Toronto, Ontario, Canada.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York, N. Y.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—F. O. Whiteman, Union Station, St. Louis, Mo. Annual meeting, June 18-20, 1935, Hotel Sherman, Chicago, Ill.

AMERICAN ASSOCIATION OF RAILWAY ADVERTISING AGENTS.—E. A. Abbott, Poole Bros., Inc., 85 W. Harrison St., Chicago, Ill.

AMERICAN ASSOCIATION OF SUPERINTENDENTS OF DINING CARS.—F. R. Borger, C. I. & L. Ry., 836 S. Federal St., Chicago, Ill. Annual meeting, San Francisco, Cal.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W. Ry., 319 N. Waller Ave., Chicago, Ill. Annual meeting, October 15-17, 1935, Hotel Stevens, Chicago, Ill. Exhibit by Bridge and Building Supply Men's Association.

AMERICAN RAILWAY CAR INSTITUTE.—W. C. Tabbert, 19 Rector St., New York, N. Y.

AMERICAN RAILWAY DEVELOPMENT ASSOCIATION.—E. H. Gurton, Mgr., Land Settlement and Development, C. N. R., St. Paul, Minn.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—Works in co-operation with the Association of American Railroads, Division IV.—E. H. Fritch, 59 E. Van Buren St., Chicago, Ill. Annual meeting, March 12-14, 1935, Palmer House, Chicago, Ill.

AMERICAN RAILWAY MAGAZINE EDITORS' ASSOCIATION.—John Ferrick, Missouri Pacific Lines Magazine, 2108 Missouri Pacific Lines Bldg., St. Louis, Mo. Spring meeting, April 4-5, 1935, Buccaneer Hotel, Galveston, Tex.

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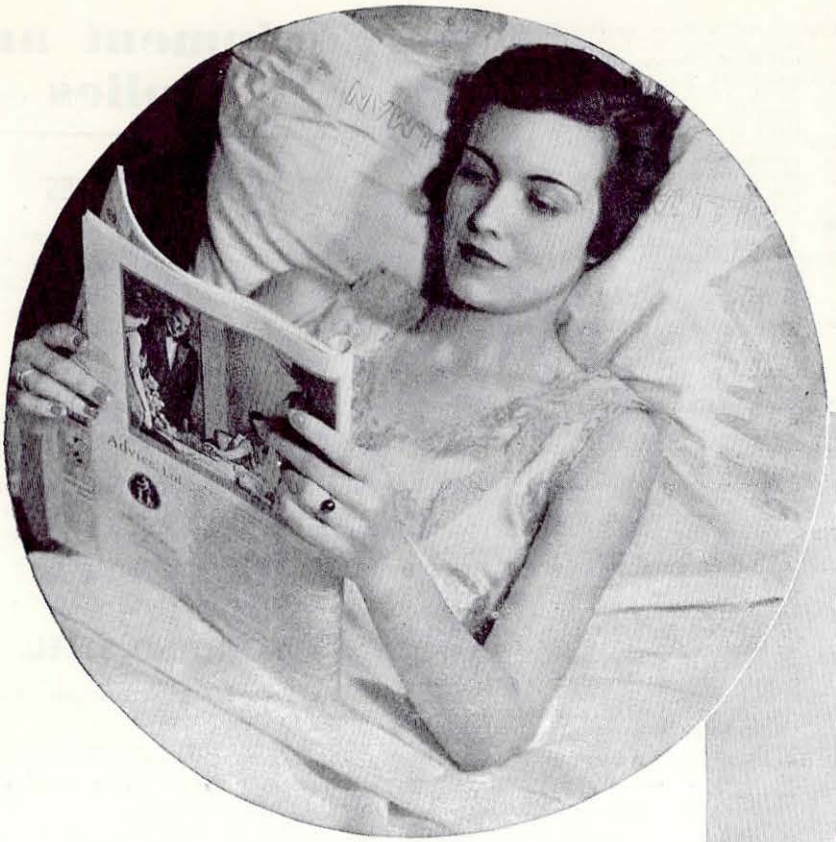
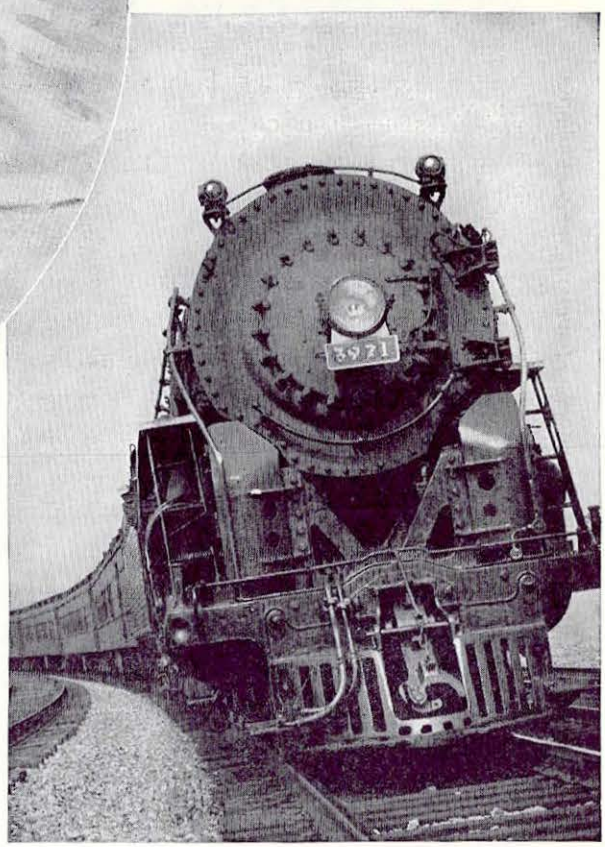


AIR CONDITIONING MAKES LUXURIOUS TRAINS!



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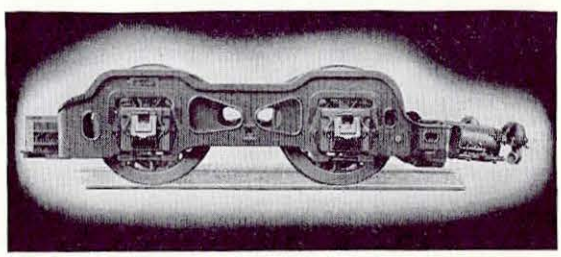
Every effort towards more luxurious, more comfortable passenger travel is enhanced by utilization of The Locomotive Booster.

Along with the luxury that air conditioning brings, The Locomotive Booster provides added comfort in that it not only starts the train smoothly and without shock but also accelerates the train to road speeds more quickly.

The luxury of air conditioning needs extra power. On such trains The Booster is a necessity for comfortable travel as well as to meet the demand for higher speed.



Booster Repair Parts made by the jigs and fixtures that produced the original are your best guarantee of satisfactory performance.

FRANKLIN RAILWAY SUPPLY COMPANY, INC.

NEW YORK CHICAGO MONTREAL

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—G. G. Macina, C. M. St. P. & P. R. R., 11402 Calumet Ave., Chicago, Ill.

AMERICAN SHORT LINE RAILROAD ASSOCIATION.—R. E. Schindler, Union Trust Bldg., Washington, D. C.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—29 W. 39th St., New York, N. Y. Railroad Division. — Marion B. Richardson, 192 E. Cedar St., Livingston, N. J. Spring meeting, June 19-21, 1935, Hotel Gibson, Cincinnati, Ohio.

AMERICAN TRANSIT ASSOCIATION.—Guy C. Hecker, 292 Madison Ave., New York, N. Y.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—H. L. Dawson, 1427 Eye St., N. W., Washington, D. C. Annual meeting, 1936, Memphis, Tenn.

ASSOCIATION OF AMERICAN RAILROADS.—H. J. Forster, Transportation Bldg., Washington, D. C.

Division I.—Operating.—J. C. Caviston, 30 Vesey St., New York, N. Y.

Freight Station Section.—R. O. Wells, Freight Agent, Illinois Central Railroad, Chicago, Ill. Annual meeting, June 18-20, 1935, Chicago, Ill.

Medical and Surgical Section. — J. C. Caviston, 30 Vesey St., New York, N. Y.

Protective Section.—J. C. Caviston, 30 Vesey St., New York, N. Y.

Safety Section.—J. C. Caviston, 30 Vesey St., New York, N. Y.

Telegraph and Telephone Section.—W A. Fairbanks, 30 Vesey St., New York, N. Y. Annual meeting, June 25-27, 1935, Hotel Stevens, Chicago, Ill.

Division II.—Transportation.—G. W. Covert, 59 E. Van Buren St., Chicago, Ill.

Division III.—Traffic.—J. Gottschalk, 143 Liberty St., New York, N. Y.

Division IV.—Engineering.—E. H. Fritch, 59 E. Van Buren St., Chicago, Ill. Annual meeting, March 12-14, 1935, Palmer House, Chicago, Ill.

Construction and Maintenance Section.—E. H. Fritch, 59 E. Van Buren St., Chicago, Ill. Annual meeting, March 12-14, 1935, Palmer House, Chicago, Ill.

Electrical Section.—E. H. Fritch, 59 E. Van Buren St., Chicago, Ill.

Signal Section.—R. H. C. Balliet, 30 Vesey St., New York, N. Y. Annual meeting, March 11-12, 1935, Hotel Stevens, Chicago, Ill.

Division V.—Mechanical. — V. R. Hawthorne, 59 E. Van Buren St., Chicago, Ill. Next meeting, June, 1935, Chicago, Ill.

Division VI.—Purchases and Stores.—W. J. Farrell, 30 Vesey St., New York, N. Y.

Division VII.—Freight Claims.—Lewis Pilcher, 59 E. Van Buren St., Chicago, Ill.

Division VIII.—Motor Transport.—George M. Campbell, 30 Vesey St., New York, N. Y.

Car-Service Division.—C. A. Buch, Transportation Bldg., Washington, D. C.

Finance, Accounting, Taxation and Valuation Department.—E. H. Bunnell, Vice-President, Transportation Bldg., Washington, D. C.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—F. L. Johnson, Chief Clerk and Claim Agent, General Claims Dept., Alton R. R., 340 W. Harrison St., Chicago, Ill. Annual meeting, May 15-17, 1935, Hotel Biltmore, New York, N. Y.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W., 1519 Daily News Bldg., 400 W. Madison St., Chicago, Ill.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—L. F. Flanagan, Detroit Graphite Company, Room 1158, 20 N. Wacker Drive, Chicago, Ill. Meets with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—C. R. Crook, 2276 Wilson Ave., N. D. G., Montreal, Que. Regular meetings, second Monday of each month, except June, July and August, Windsor Hotel, Montreal, Que.

CAR DEPARTMENT OFFICERS' ASSOCIATION.—A. S. Sternberg, M. C. B. Belt Ry. of Chicago, 7926 S. Morgan St., Chicago, Ill.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—G. K. Oliver, 2514 W. 55th St., Chicago, Ill. Regular meetings, second Monday of each month, except June, July and August, La Salle Hotel, Chicago, Ill.

CAR FOREMEN'S ASSOCIATION OF LOS ANGELES.—J. W. Krause, Room 299, 610 S. Main St., Los Angeles, Cal. Club not active at present.

CAR FOREMEN'S ASSOCIATION OF ST. LOUIS, MO.—E. G. Bishop, Illinois Central R. R., East St. Louis, Ill.

CENTRAL RAILWAY CLUB OF BUFFALO.—M. D. Reed, 1817 Hotel Statler, McKinley Square, Buffalo, N. Y. Regular meetings, second Thursday of each month, except June, July and August, Hotel Statler, Buffalo, N. Y.

CINCINNATI RAILWAY CLUB.—D. R. Boyd, 2920 Utopia Place, Hyde Park, Cincinnati, Ohio. Operation suspended indefinitely.

CLEVELAND RAILWAY CLUB.—F. L. Frericks, 14416 Alder Ave., Cleveland, Ohio. Meetings temporarily suspended.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—W. J. Mayer, Michigan Central R. R., Detroit, Mich.

INTERNATIONAL RAILWAY FUEL ASSOCIATION. — T. D. Smith, 1660 Old Colony Bldg., Chicago, Ill. Annual meeting, May 6-8, 1935, Hotel Sherman, Chicago, Ill. (tentative).

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1061 W. Wabasha St., Winona, Minn. Annual meeting, May 2-4, 1935, Hotel Sherman, Chicago, Ill. (tentative).

MASTER BOILER MAKERS' ASSOCIATION. — A. F. Stiglmeier, 29 Parkwood St., Albany, N. Y.

NATIONAL ASSOCIATION OF RAILROAD AND UTILITIES COMMISSIONERS.—Clyde S. Bailey, Washington, D. C. Annual meeting, October 15-18, 1935, Nashville, Tenn.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Kelly, Suite 322, 910 S. Michigan Ave., Chicago, Ill. Exhibit at A. R. E. A. Convention, March 11-14, 1935, The Coliseum, Chicago, Ill.

NATIONAL SAFETY COUNCIL.—Steam Railroad Section (see Safety Section, Association of American Railroads).

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings, second Tuesday of each month, except June, July, August and September, Copley-Plaza Hotel, Boston, Mass.

NEW YORK RAILROAD CLUB. — D. W. Pye, 30 Church St., New York, N. Y. Regular meetings, third Friday of each month, except June, July and August, 29 W. 39th St., New York, N. Y.

PACIFIC RAILWAY CLUB.—William S. Wollner, P. O. Box 3275, San Francisco, Cal. Regular meetings, second Thursday of each month, alternately at San Francisco and Oakland, excepting July at Los Angeles and October at Sacramento.

RAILWAY ACCOUNTING OFFICERS' ASSOCIATION.—(Merged with Association of American Railroads.)

RAILWAY BUSINESS ASSOCIATION.—P. H. Middleton (Treas. and Asst. Sec.), First National Bank Bldg., Chicago, Ill. Annual meeting, November, 1935, Hotel Stevens, Chicago, Ill.

RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, 1941 Oliver Bldg., Pittsburgh, Pa. Regular meetings, fourth Thursday of each month, except June, July and August, Fort Pitt Hotel, Pittsburgh, Pa.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—Edward Wray, 9 S. Clinton St., Chicago, Ill. Meets with Association of Railway Electrical Engineers.

RAILWAY FIRE PROTECTION ASSOCIATION.—R. R. Hackett, Baltimore & Ohio R. R., Baltimore, Md.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION. —J. D. Conway, 1941 Oliver Bldg., Pittsburgh, Pa. Meets with Mechanical Division, Purchases and Stores Division, and Motor Transport Division, Association of American Railroads.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, Waterbury Battery Company, 30 Church St., New York, N. Y. Meets with Telegraph and Telephone Section of A. A. R., Division I.

RAILWAY TIE ASSOCIATION.—A. S. Fathman, Railway Exchange Bldg., St. Louis, Mo. Annual meeting, May 15-17, 1935, St. Louis, Mo.

RAILWAY TREASURY OFFICERS' ASSOCIATION. — L. W. Cox, 1428 Broad Street Station Bldg., Philadelphia, Pa.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—T. F. Donahoe, Gen. Supvr. Road, Baltimore & Ohio, Pittsburgh, Pa. Annual meeting, September 17-19, 1935, Hotel Stevens, Chicago, Ill.

SIGNAL APPLIANCE ASSOCIATION.—G. A. Nelson, Waterbury Battery Company, 30 Church St., New York, N. Y. Meets with A. A. R. Signal Section.

SOCIETY OF OFFICERS, UNITED ASSOCIATIONS OF RAILROAD VETERANS.—M. W. Jones, Baltimore & Ohio, Mt. Royal Station, Baltimore, Md. Annual meeting, October 5-6, 1935, Cincinnati, Ohio.

SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.—A. T. Miller, 4 Hunter St., S. E., Atlanta, Ga. Regular meetings, third Thursday in January, March, May, July, September and November, Ansley Hotel, Atlanta, Ga.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—R. G. Parks, A. B. & C. R. R., Atlanta, Ga.

TOOL FOREMEN SUPPLIERS' ASSOCIATION.—E. E. Caswell, Union Twist Drill Co., 11 S. Clinton St., Chicago, Ill. Meets with American Railway Tool Foremen's Association.

TORONTO RAILWAY CLUB.—R. H. Burgess, P. O. Box 8, Terminal "A," Toronto, Ont. Regular meetings, first Friday of each month, except July, August and September, Royal York Hotel, Toronto, Ont.

TRACK SUPPLY ASSOCIATION. — D. J. Higgins, Gardner-Denver Company, 332 S. Michigan Ave., Chicago, Ill. Meets with Roadmasters' and Maintenance of Way Association.

TRAVELING ENGINEERS' ASSOCIATION. — W. O. Thompson, 1177 E. 98th St., Cleveland, Ohio.

WESTERN RAILWAY CLUB.—C. L. Emerson, C. M. St. P. & P., Chicago, Ill. Regular meetings, third Monday of each month, except June, July, August and September, Hotel Sherman, Chicago, Ill.

Equipment and Supplies

LOCOMOTIVES

THE UNITED STATES NAVY DEPARTMENT, Bureau of Supplies and Accounts, Washington, D. C., is inquiring for bids on March 8, for two 30-ton Diesel-electric switching locomotives.

FREIGHT CARS

THE MERRIMAC CHEMICAL COMPANY has ordered from the American Car & Foundry Company one tank car of 70 tons' capacity, Class 103A, for carrying sulphuric acid and one tank car of 40 tons' capacity, Class 105A-300, for carrying chlorine.

IRON AND STEEL

THE PERE MARQUETTE is inquiring for 200 tons of tie plates.

THE SOUTHERN PACIFIC has ordered 6,000 tons of tie plates from the Columbia Steel Company.

AIR CONDITIONING

THE CHICAGO & NORTH WESTERN has placed an order with the Waukesha Motor Co. for 54 Waukesha-Melcher multiple system air conditioning units, which the railroad will install in day coaches and lounge cars for use in the San Francisco-Overland Limited.

THE UNION PACIFIC has placed an order with Fairbanks, Morse & Co., for axle-driven generators and motors for driving compressors, condenser fans, air conditioner and distribution fans for installation in five passenger cars which will be equipped with York Ice Machinery Corp. air conditioning equipment.

THE CENTRAL OF GEORGIA has given a contract to the Safety Car Heating & Lighting Company for steam ejector air-conditioning systems to be installed in two of its existing coaches. They will be equipped with one 7½ kw. generator having a flat belt drive and with an Edison storage battery of 600 amp. hr. capacity. The company is remodeling the interior of these cars installing bucket type seats and a buffet. They will be in operation in May between Savannah, Ga., and Atlanta.

THE FLORIDA EAST COAST last year installed air-conditioning equipment in six Pullman lounge and sleeping cars, using the mechanical system of the Pullman Company. The cars are equipped with one 15 kw. and one 4 kw. generator and an Exide storage battery of 1,000 amp. capacity. Work is now under way installing on existing cars air-conditioning equipment on three dining cars and eight coaches using the steam ejector system of the Safety Car Heating & Lighting Company. The dining cars will be equipped with Edison storage batteries of 750 amp. hour capacity and the coaches with Edison

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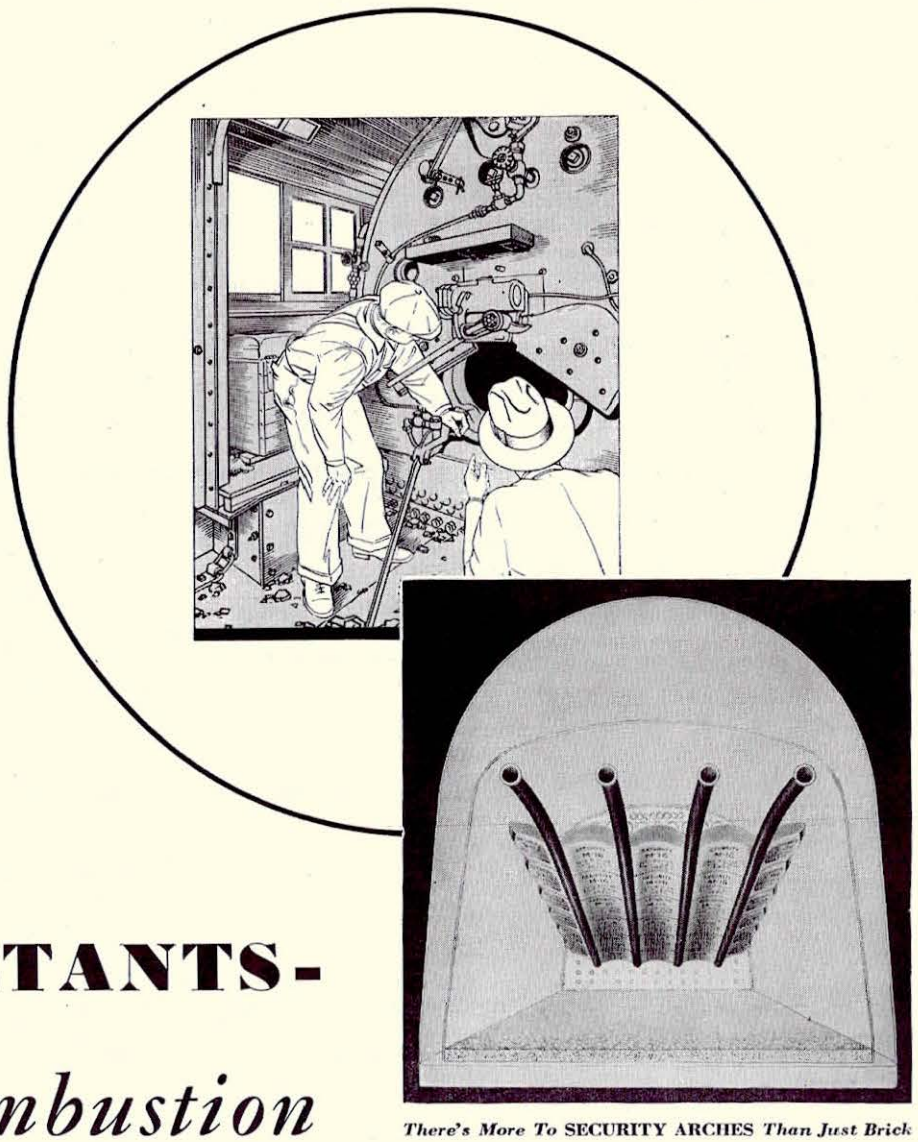

There's More To SECURITY ARCHES *Than Just Brick*

CONSULTANTS-
On Combustion

In their many years' study of what goes on in a locomotive boiler and firebox, the service men of American Arch Company have acquired an experience that is not available elsewhere.

Many combustion difficulties arising from other causes than Locomotive Arches have been overcome thru the sound advice of these combustion experts.

Their counsel is available to all customers of American Arch Company and is one of the many ways in which American Arch Company makes every effort to insure the railroads the greatest possible service from Locomotive Arches.

HARBISON-WALKER REFRACTORIES CO.

Refractory Specialists

NRA MEMBER U.S. WE DO OUR PART

AMERICAN ARCH CO.
INCORPORATED

Locomotive Combustion Specialists » » »

storage batteries of 600 amp. hour capacity. Electric power will be provided by one 3 kw. and one 5 kw. generator on the diners and by one 3 kw. and one 4 kw. generator on the coaches. This equipment is expected to be in service by May 1.

PENNSYLVANIA.—Work will be started at once by the Pennsylvania and the Pullman Company installing air-conditioning equipments in additional cars in Pennsylvania service so that all the east and west through trains will be so equipped and ready for service in May. This will bring to 887 the total of air-conditioned cars, both Pullman and P. R. R., in service on the Pennsylvania. Supplementing 272 Pennsylvania cars at present air-conditioned, the railroad will equip 39 coaches, 20 combination passenger and baggage cars and 19 dining cars, a total of 78, while the Pullman Company will simultaneously increase its quota of air-conditioned cars assigned to Pennsylvania trains to 537. The installation and class repairs on the 78 Pennsylvania cars will be carried out in the company's shops at Altoona, Pa., and will give employment to a large number of shop workers and to others supplying the material and equipment.

MISCELLANEOUS

THE ERIE has given a contract to the Sun Shipbuilding & Dry Dock Company for the construction of a new ferryboat.

THE NEW YORK CENTRAL has placed an order with the Valve Pilot Corporation, New York, for 24 additional Loco Valve Pilots to be applied to freight power.

MISSOURI-PACIFIC.—The trustees of this road have been authorized to spend $5,584,603 for improvements on the lines of the Missouri Pacific and its subsidiaries. Of the total amount, $4,330,279 is to be used on the parent property and the remainder on subsidiaries.

Construction

PENNSYLVANIA.—A contract has been given to James Stewart & Company, Inc., New York, to construct new platforms and make changes in present facilities, to provide for new mail-handling equipment at Pennsylvania station, New York City.

PITTSBURGH & LAKE ERIE.—Bids have been received for building train sheds and shelters at Pittsburgh, Pa., to cost about $75,000.

SEABOARD AIR LINE—The Interstate Commerce Commission has authorized the receivers of this company to construct a branch line from a point on its main line four miles north of Trout River easterly and southerly to a new branch of the Union Bag & Paper Corp., at Dames Point, Fla., 7.5 miles; estimated cost, $155,910.

Supply Trade

Leon C. Roy, secretary and assistant treasurer of the **Ralston Steel Car Company,** Columbus, Ohio, has been appointed secretary and treasurer and **Blair C. Hanna** has been appointed manager of sales.

Herbert S. Freeman has been appointed Loadmaster distributor for the **Bucyrus-Erie Company,** South Milwaukee, Wis., for the western portion of New York with headquarters at 49 Darwin street, Rochester, N. Y.

Frank P. Roesch, general sales manager of the **Standard Stoker Company, Inc.,** has been appointed a vice-president and in this capacity will continue his direction of sales, with headquarters, as formerly, at Chicago.

L. G. Sullivan, eastern sales representative at New York, of the **Atlas Steel Castings Company,** Buffalo, N. Y., has been elected a vice-president. Mr. Sullivan will continue in charge of eastern sales with headquarters as formerly at New York.

The Gould Storage Battery Corporation, Depew, N. Y., has moved its Chicago office from 32 West Randolph street to larger quarters at 227 Garvey court, Chicago, where it will maintain a district office and service station with facilities to handle its increased business.

The American Brake Shoe & Foundry Company, New York, has purchased the plant and equipment of the **Railway Materials Corporation** at Toledo, Ohio. The plant will be known as the Toledo plant of the American Brake Shoe & Foundry Company and will be operated under the direction of **W. H. Winters,** vice-president in charge of operations.

George H. Bucher, president and general manager of the **Westinghouse Electric International Company** has been elected a vice-president of the **Westinghouse Electric & Manufacturing Company,** with headquarters at New York, retaining also his position as president and general manager of the **Westinghouse Electric International Company.** After graduating from Pratt Institute, Brooklyn, N. Y., in both steam and machine design and in electrical engineering, Mr. Bucher joined the Westinghouse Electric & Manufacturing Company at East Pittsburgh, Pa., as a graduate student and has been connected with the Westinghouse organization since September, 1909. In 1911 he was transferred to the export department at New York; in 1920 he was appointed assistant to the general manager of the Westinghouse Electric International Company and one year later was promoted to assistant general manager. In 1932 he was elected vice-president and general manager and since 1934 has served as president and general manager of the same company.

George H. Bucher

American Steel Foundries

The annual report of the American Steel Foundries for 1934 shows a net profit of $245,365, as compared with a net loss for the previous year of $1,400,640. Current assets amounted to $11,446,027, and current liabilities to $862,560, the ratio of quick assets to liabilities being 13.35 to 1, and the net working capital $10,651,751. During the year the net additions to property amounted to $16,403, while depreciation was provided in the amount of $930,853. The usual preferred stock sinking fund, amounting to $90,513, was set aside and carried in a separate bank account. Through this fund a total of 1,050 shares of preferred stock were retired.

The consolidated income account for the year ending December 31, 1934, with comparisons with 1933, follows:

	1934	1933
Profit from operations, after deducting manufacturing, selling and administrative expenses, but before provision for depreciation	$1,168,867	* $478,207
Deduct depreciation	930,853	959,169
Profit from operations	$238,014	*$1,437,376
Miscellaneous income:		
Interest, discount and exchange	$27,009	$36,174
Income from investments	61,852	121,888
Less miscellaneous net charges to income	.....	115,215
Total profit and income	$326,875	*$1,394,529
Deduct:		
Reserve for federal income taxes	$74,906	.....
Net earnings of subsidiary company appertaining to outstanding minority stockholdings	6,604	* $6,111
Net income carried to earned surplus	$245,365	*$1,400,640

* Loss.

American Locomotive Company Annual Report

The American Locomotive Company for the year ended December 31, 1934, reported a loss of $2,156,837 after all charges but before adjustments for income represented by the 1934 appreciation in the market value of securities previously written down. Thus, while the foregoing figure is the one comparable to the 1933 loss of $1,889,603, the above-mentioned adjustment of security values, which still leaves these holdings on the basis of the lower of cost or market but not in excess of par value, reduced the 1934 loss by $85,011 or to a net deficit of $2,071,826.

During 1934 the company received

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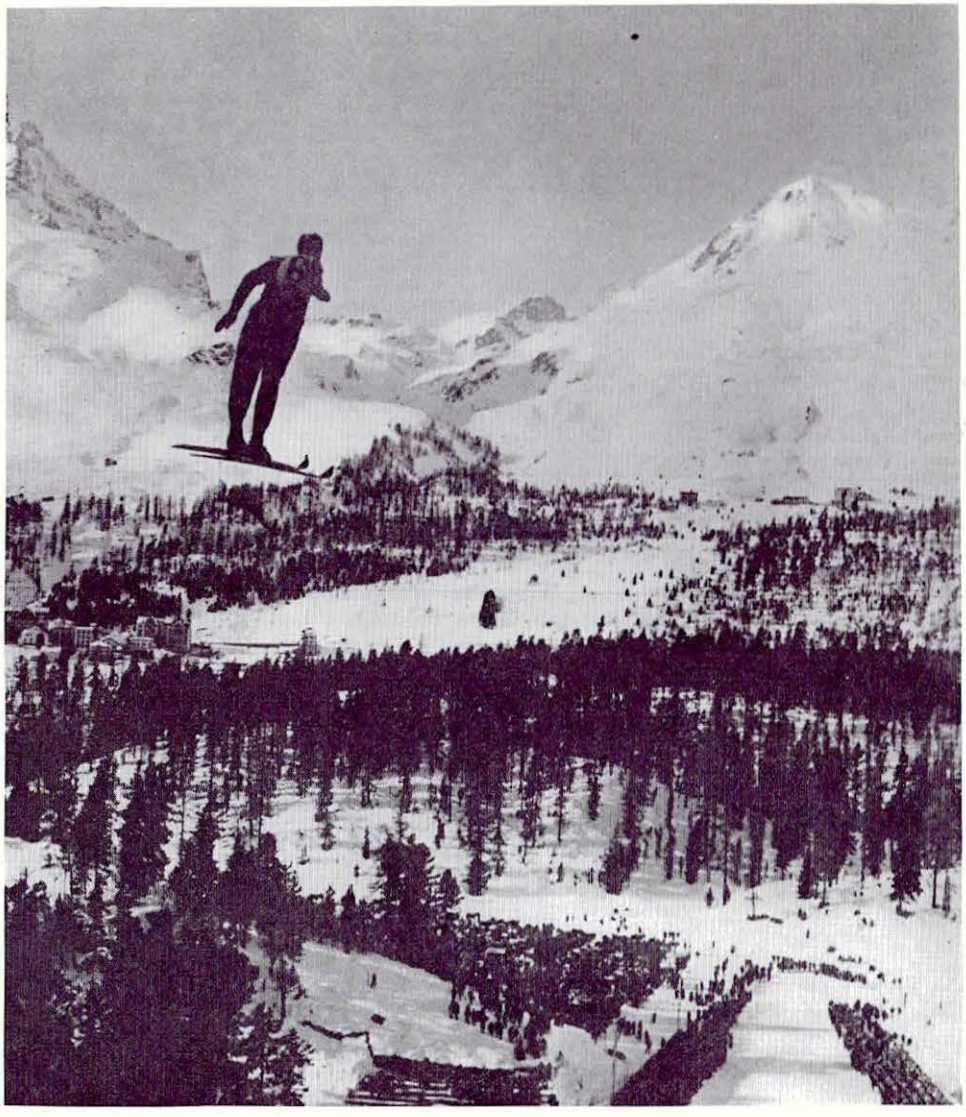
Specialization



SUCCESSFUL skiing is highly specialized — it requires specialized knowledge, years of application, absolute control. Without any one of these three requisites, skiing is apt to become disastrous.

Successful reconditioning of unserviceable superheater units is also highly specialized and requires the same three elements of success. Omission of any one is apt to lead to failure.

The Elesco unit REmanufacturing service is backed by knowledge and experience gained through specializing in the development and manufacture of Elesco superheaters for American railroads. Through special forging methods, absolute control and testing, developed for manufacturing superheater units, we remake unserviceable superheater units . . . . restore them to a condition practically equal to new units . . . . at about half the cost for new units.

Employ Elesco specialization when your superheater units become worn and unserviceable. We rebuild them so that there will be no high roundhouse charges for the superheater or train failures caused by a failed superheater.

ELESCO

A-964

THE SUPERHEATER COMPANY

Representative of AMERICAN THROTTLE COMPANY, Inc.

60 East 42nd Street, NEW YORK — Peoples Gas Building, CHICAGO

Canada: The Superheater Company, Limited, Montreal

Superheaters - Feed Water Heaters - Exhaust Steam Injectors - Superheated Steam Pyrometers - American Throttles

orders for 58 locomotives, 42 of which were shipped during the year together with the shipment of two locomotives ordered during the previous year, making a total of 44 locomotives shipped last year. There were unfilled orders on the books at the beginning of this year for 16 locomotives and other business amounting in total to $2,703,374 as compared with $3,500,782 on January 1, 1934.

The company continues to maintain its strong liquid position since the balance sheet as of December 31, 1934, shows an excess of current assets over current liabilities in the amount of $14,401,477. Furthermore, the company had no loans payable and had in its treasury $8,038,097 in cash and marketable securities of which $939,905 was in United States and Canadian government obligations, $2,971,854 in railroad equipment trust certificates, $740,520 in other securities and $3,385,819 in cash. The company has no funded debt.

The consolidated income and surplus accounts for the year ended December 31, 1934 follow:

Consolidated Income and Surplus Accounts

American Locomotive Company and subsidiaries
For the year ended December 31, 1934

Consolidated Income Account

Net loss after deducting manufacturing, maintenance and administrative expenses		$1,465,265
Depreciation on plants and equipment		585,525
		$2,050,790
Federal Income and Capital Stock taxes		106,047
Loss before adjustments		$2,156,837
Income represented by appreciation in the market value of securities previously wrtiten down, applicable to the year 1934, on the basis of the lower of cost or market, but not in excess of par value		85,011
Loss for the year		$2,071,826

Consolidated Surplus Account

Surplus, December 31, 1933		$15,356,865
Additions to surplus—		
Appreciation in the market value of securities previously written down, applicable to a previous period, on the basis of the lower of cost or market, but not in excess of par value	$131,046	
Excess accruals in prior years—		
State and local taxes	123,386	
Accident indemnity	200,000	
	$454,432	
Less additional reserves created for contingencies and other items	200,000	
		254,432
		$15,611,297
Loss for year ended December 31, 1934		2,071,826
Surplus, December 31, 1934		$13,539,471
Earned Surplus	$9,361,222	
Capital Surplus	4,178,250	

Chicago Railway Equipment Company

The annual report of the Chicago Railway Equipment Company for 1934 shows a profit of $61,289 as compared with a net loss of $115,935 in 1933. The profit from operations after deducting manufacturing, selling and administrative expenses amounted to $116,105, while income from investments, rentals and the profit on the sale of marketable securities amounted to $50,184. From this was deducted $105,000 for depreciation of plant and federal income taxes, leaving a profit for the year of $61,289, and increasing the earned surplus which on December 31, 1933, amounted to $35,274 to $96,563 as of December 31, 1934.

A. C. Moore, president, in his report to stockholders said:

> The railroad prospect, with which your company is particularly concerned, largely depends upon the trend of general business. There are other factors, however, which affect it and which warrant encouragement. While bills aimed at increasing railway costs, through insistance upon shorter hours without reduction in compensation, through the limitation of car length of trains, through regulation of man-power in train operation, and other burdensome measures have been introduced in Congress, there seems to be little ground for expecting their enactment into law. On the other hand, there is reason to anticipate legislation which will be beneficial, especially that which will more nearly establish equal competition between the railways and other carriers. The President has made transportation legislation a definite part of his program, and public sentiment seems to be crystallizing in favor of a national transportation policy that will eventually place all forms of transportation on a parity, at least so far as regulation is concerned. In addition there have been certain accomplishments by the railroads themselves, the outstanding achievement being the organization of the Association of American Railroads. There is persistent demand in the public interest for constructive treatment of the transportation problem by those in private and business life who share the responsibility for recovery programs. Much depends upon the wisdom and course of action of those directing the affairs of government.

Baldwin Locomotive Works Files Reorganization Petition

The Baldwin Locomotive Works on February 25 filed in the United States District Court at Philadelphia, Pa., a petition seeking permission to reorganize under the provisions of Section 77 (b) of the National Bankruptcy Act. The action, brought on behalf of the parent corporation, in no way affects the status of any of the Baldwin subsidiaries.

Judge Dickinson, who presided at the hearing, entered an order approving the petition as complying with the statutory requirements and providing that the present Baldwin management may continue temporarily in possession of the properties and to operate the business as heretofore. Pursuant to the terms of the order President George H. Houston has announced that "the business of the Baldwin Locomotive Works will be continued for the present at least without cessation of operations or change in operating conditions or business relations."

The reorganization move was forecast in President Houston's annual report for 1934 wherein he called attention to the fact that operating losses experienced since 1931, together with bond amortization charges, have depleted the Baldwin working capital "until it is inadequate for present operating requirements and the payment of fixed charges." Mr. Houston then added: "Plans for meeting this difficult situation by reduction of fixed charges and provision of additional working capital are now being formulated and, when ready, will be submitted to all classes of security holders for their consideration."

The new reorganization proposal follows capital stock adjustments made last year when the stated value of the outstanding common stock was reduced from $20.98 per share to $10 per share, thus creating a capital surplus of $11,586,000 which has been used to effect write-downs of the book value of certain items of property, plant and equipment and of investments.

The 1934 report tabulates the consolidated sales, sales of locomotive products and the profit or loss before interest and depreciation for the five years since 1930. These figures reveal that in no year since 1930 has an operating profit been reported. Consolidated sales fell from $49,872,456 in 1930 to a low $8,250,319 in 1933 and rose again to $14,554,445 in 1934; sales of locomotive products, which totaled $31,026,055 in 1930, fell to $1,037,104 in 1933, but were $3,396,733 in 1934.

Thus while 1934 was the company's best year of the past three it nevertheless brought a consolidated net loss of $3,698,495 after a $1,856,234 provision for depreciation, interest charges of $1,092,958 and adjustments for the equity of minority stockholders in the net profit of the Midvale Company and in the loss of the Whitcomb Locomotive Company. This 1934 deficit compares with the 1933 consolidated net loss of $3,857,744 and with a 1932 deficit of $4,078,132. Of the total 1934 business 77 per cent was outside the locomotive field as compared with 87 per cent in 1933 and 71 per cent in 1932.

The balance sheet as of December 31, 1934, shows that Baldwin had outstanding in the hands of the public $2,676,000 of its first mortgage 5 per cent sinking fund gold bonds, due in 1940, and $10,473,600 of its five-year 6 per cent consolidated mortgage bonds, due in 1938. Also, in addition to the common stock, carried at $11,014,300, there was outstanding a $20,000,000 issue of 7 per cent cumulative preferred stock.

Current assets at the close of last year totaled $12,702,778 and current liabilities $2,498,972, leaving net current assets of $10,203,806 as compared with $13,498,039 on December 31, 1933.

Commenting in the report on the 1934 results President Houston points out that requirements of codes of fair competition under which the company's operations were carried on increased costs substantially; but competition prevented a corresponding increase in sales prices and therefore "the margin between sales price and prime cost was abnormally low." Also, because of this "the outlook for 1935 is uncertain," for, although the company started this year with more orders on hand than at the beginning of any other year since 1930, "these orders were taken at close prices, and are being performed now under the same conditions of high cost which prevailed during 1934."

The report also calls attention to the fact that a large portion of the company's 1934 business was financed by advances to the purchasers by the Public Works Administration; "The financing of railroad equipment by this medium," it adds, "has been particularly successful from the viewpoint of the volume of employment created in proportion to the volume of financing done and with regard to the promptness with which the securities resulting from some of these transactions have been marketed by the government agency holding them."

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AMERICAN LOCOMOTIVE CO.

"IN spite of new inventions and new competition, the steam locomotive still stands unchallenged as the simplest, most flexible, best all-around source of power on wheels ever developed. And those who say that steam is doomed are talking through their hats."

By Harwood F. Merrill
In Forbes Magazine, January 1, 1935.

30 CHURCH ST., NEW YORK, N.Y.

Financial

ATLANTIC COAST LINE.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue and sell and deliver $12,000,000 of general unified mortgage 50-year 4½ per cent bonds, the proceeds to be used to retire maturing notes and bonds.

BALTIMORE & OHIO.—*New Director.*—At a meeting of the directors of this company on February 20 Harry Bronner, capitalist, of New York, was elected a director.

BOYNE CITY.—*Acquisition.*—The Boyne City Railroad has applied to the Interstate Commerce Commission for authority to acquire from the owners the line formerly operated by the Boyne City, Gaylord & Alpena from Boyne City to Alpena, Mich., 90.7 miles, and to operate that portion from Boyne City to Boyne Falls, 7 miles.

CHICAGO & NORTH WESTERN.—*R.F.C. Loan.*—This company has applied to the Reconstruction Finance Corporation for an extension for four years of loans maturing April 13 amounting to $3,807,583.

CHICAGO & NORTH WESTERN.—*R. F. C. Equipment-Repairs Loan.*—This road has applied to the Reconstruction Finance Corporation for a loan of $1,500,000 for improvements and repairs to locomotives and cars.

CHICAGO & NORTH WESTERN.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to pledge $9,084,000 of general mortgage 5 per cent bonds as collateral for short-term notes.

CHICAGO, ROCK ISLAND & PACIFIC.—*Special Counsel*—Trustees for the Chicago, Rock Island & Pacific were authorized to employ former Senator Otis F. Glenn as special counsel in reorganization proceedings under Section 77 of the new bankruptcy act, in an opinion rendered at Chicago on February 20 by Presiding Judge Evan A. Evans of the United States District Court of Appeals, acting as a district judge. The decision followed a controversy between the Reconstruction Finance Corporation and the trustees, in which the former contended the appointment of Mr. Glenn was a violation of the contract agreement whereby the company and trustees must first seek the approval of the Reconstruction Finance Corporation before making appointments which carry a salary of more than $4,800 a year. Judge Evans, in developing his opinion, cited the fact that the road now has 22 attorneys, whose salaries range from $2,400 a year to $25,000, but mostly under $10,000. He said it was the duty of the trustees to get the best possible legal advice and that, while he felt the road's attorneys were competent, the trustees could be justified in going elsewhere to get counsel to represent them in the reorganization. The Rock Island owes the RFC approximately $13,600,000.

DALLES & SOUTHERN.—*R. F. C. Loan.*—This company has applied to the Interstate Commerce Commission for a loan of $100,000 for taxes, rehabilitation of the line and completion of an extension.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—*R. F. C. Loan.*—This company has applied to the Reconstruction Finance Corporation for an extension for two years from February 27 of the unpaid balance of its loans from the R. F. C. amounting to $1,330,366.

MINNEAPOLIS & ST. LOUIS.—*Eight Railroads Agree On Purchase Plan.*—Chairman Jones of the Reconstruction Finance Corporation announced on February 27 that at a conference in his office the day before officers of eight railroads connecting with the M. & St. L. had agreed, subject to the approval of the Interstate Commerce Commission of the entire plan, to bid $7,200,000 for the property, taking its equipment subject to outstanding equipment trust notes of $1,018,000. The eight roads are the Chicago, Burlington & Quincy, the Chicago & Northwestern, the Chicago Great Western, the Chicago, Rock Island & Pacific, the Illinois Central, the Great Northern, the Wabash, and the Chicago, Milwaukee, St. Paul & Pacific. "As far as our directors are able to see," Mr. Jones said, "the plan seems an equitable solution of an unhealthy railroad situation in the particular territory, and if approved by the Interstate Commerce Commission, the federal court, and any other authority having jurisdiction over any part of the property, the R.F.C. is willing to lend the $7,200,000 to the purchasing roads, upon the security of the property purchased. And while if the property is sold at this price or at approximately this price, the bondholders will get only a small percentage of the face of their bonds, depending to some extent upon the terms of settlement that may be reached with creditors whose rights are not foreclosed by the decree, it appears that if the road continues in receivership or is reorganized by the issuance of new securities, its chances of staying out of trouble in the future are poor, likewise the prospects of the security holders.

"The Wabash has no direct interest, but its service to the Twin Cities would be affected, and satisfactory arrangements are included to protect this service. The other seven roads that agree to participate in the purchase if the plan is approved, could use the extra mileage in such a way as to provide the territory occupied with as good, if not better, service than can possibly be furnished by an impoverished road. The plan also gives the Illinois Central direct entrance to Minneapolis over its own rails. Representatives of the interested roads have given a great deal of time and consideration to the suggested plan, and, based upon the history and earnings of the Minneapolis & St. Louis, the price which they are willing to undertake to pay seems fair, and in all probability more than the creditors and security holders would get under a reorganization or a continuation of the receivership. In addition to the indicated offer of something more than $8,000,000, the purchasing roads estimate that it will be necessary for them to spend not less than $3,000,000 to improve and rehabilitate the property. They will be required to furnish these additional funds.

"Most communities served by the Minneapolis & St. Louis are also served by other railroads. To protect any that are not, and to minimize public inconvenience, the plan contemplates furnishing highway transportation service to communities of any substantial size which would be deprived of railroad service. The purchasing roads, as far as possible, will agree to absorb and protect displaced employees."

MISSOURI-KANSAS-TEXAS.—*Omits Interest.*—This company has announced that interest due April 1 on its cumulative adjustment mortgage 5 per cent bonds of 1967 will not be paid. The mortgage provides that interest is payable on the issue only from such portion of the net income as the directors may determine.

MISSOURI PACIFIC-NEW ORLEANS, TEXAS & MEXICO—LOUISIANA & ARKANSAS.—*Joint Operation.*—These companies have filed with the Interstate Commerce Commission a joint application for authority to construct 2.3 miles of connecting tracks to connect with the bridge being built by the state of Louisiana over the Mississippi river at Baton Rouge, La., to abandon car ferry service at that point, and to make joint use of each other's lines in the vicinity by trackage rights agreements covering a total of 210 miles which will expedite transportation service between New Orleans and Baton Rouge.

MONTANA.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon its entire railroad extending from North Spadra, Ark., to a connection with the Missouri Pacific at Montana, Ark., 2.8 miles.

NASHVILLE, CHATTANOOGA & ST. LOUIS.—*Abandonment.*—This company has been authorized to abandon a portion of a branch line extending from De Rossett, Tenn., to Clifty, 6.7 miles.

NEW YORK CENTRAL.—*R.F.C. Loans.*—This road has applied to the Reconstruction Finance Corporation and to the Interstate Commerce Commission for an extention of R. F. C. loans amounting to $15,600,000, and has filed a plan for meeting $42,000,000 of its 1935 maturities amounting to $56,000,000.

PEARL RIVER VALLEY.—*Trackage Rights.*—The Interstate Commerce Commission has authorized this company to operate under trackage rights over a line owned by the Goodyear Yellow Pine Company, extending from a connection with the Pearl River Valley at Goodyear, Miss., to the terminus of the line, 22.5 miles northeasterly thereof.

PULLMAN COMPANY.—*Final Valuation of 1931.*—The Interstate Commerce Commission has issued a final valuation report as of December 31, 1931, finding the final value for rate-making purposes of the property of the Pullman Company, owned and used for common-carrier purposes, to be $170,000,000. Some revisions were made in the tentative report which had been issued. The report says the original cost cannot be definitely determined but, upon making certain adjustments, the com-

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When Supt. Minot wrote the FIRST TELEGRAPHIC TRAIN ORDER

—on September 22, 1851, Engineer Lewis said: "Do I look like a damned fool?" and refused to run the Erie train from Turner's to Goshen. He insisted on abiding by the time table rules. Minot then took charge of the engine himself, safely running the train to Goshen, Middletown and Port Jervis, saving two hours' time for the trip. Thus another era in railroad operation was inaugurated.

When the first extensive installation of the "Union" C. T. C. system was made on the Pere Marquette in 1928, the written train order was headed for the discard, for under this modern system orders are delivered to the train by *signal indication* at the point where action must be taken. Its application enables railroads to operate entire divisions by signal indication from a centralized point with further substantial reductions in running time and operating costs. Ask our nearest district office how "Union" C. T. C. can reduce your operating expenses.

1881 **Union Switch & Signal Co.** 1935

SWISSVALE, PA.

NEW YORK MONTREAL CHICAGO ST. LOUIS SAN FRANCISCO

mission finds the approximate original cost of the common-carrier property as of 1931 to be $236,378,333, excluding land, and the total original cost for the property as a whole to be slightly less than $237,288,666. The investment of the carrier in sleeping car property, including land and structures, was recorded in the books as $249,453,125. If certain adjustments were made to conform to the uniform classification of accounts, the report says, this would become $237,731,198, of which $10,807,233, less an undetermined portion thereof allocable to offsetting items included in amounts recorded at $103,014,470, represents considerations other than money. The cost of reproduction new of the property owned and used on valuation date, exclusive of lands and working capital, was placed at $291,883,101, and the cost of reproduction less depreciation at $171,002,323. The company had claimed $40,000,000 for such intangible elements as the carrier's contract structure with railroads, trained personnel, development of sleeping-car law, records in use, etc., of which approximately three-fourths was ascribed to the unified system created by the contract structure, but the commission was not convinced that any specific value should be placed on this feature.

ST. LOUIS-SAN FRANCISCO.—*Abandonment.*—The Interstate Commerce Commission has authorized the trustees of this company and the Butler County Railroad to abandon a branch line extending from Osprey Junction, Ark., to McDougal, 6.6 miles.

SOUTHERN PACIFIC.—*Acquisition.*—This company has applied to the Interstate Commerce Commission for authority to acquire the property of the Peninsular, of which it now owns the stock.

SOUTHERN PACIFIC.—*Acquisition.*—The Interstate Commerce Commission has authorized the Texas & New Orleans to acquire the right-of-way, materials and the unfinished embankment of the Warren Central in connection with the construction of a 4.3-mile branch line connecting its line between Hockley, Tex., and Gano and a mine of the Houston Salt Company.

Average Prices of Stocks and of Bonds

	Feb. 26	Last week	Last year
Average price of 20 representative railway stocks..	30.86	33.85	45.62
Average price of 20 representative railway bonds..	73.12	76.17	77.34

Dividends Declared

Boston & Albany.—$2.00, payable March 30 to holders of record February 28.

Chesapeake Corp.—75c, quarterly, payable April 1 to holders of record March 8.

Chesapeake & Ohio.—70c, quarterly, payable April 1 to holders of record March 8; Preferred, $3.25, semi-annually, payable July 1 to holders of record June 7.

Chestnut Hill.—75c, quarterly, payable March 4 to holders of record February 20.

Delaware & Bound Brook.—$2.00, quarterly, payable February 20 to holders of record February 18.

Northern R.R. of New Jersey.—4 Per Cent Guaranteed, $1.00, quarterly, payable March 1 to holders of record February 19.

Philadelphia, Germantown & Norristown.—$1.50, quarterly, payable March 1 to holders of record February 20.

Pittsburgh, Fort Wayne & Chicago.—$1.75, quarterly, payable April 1 to holders of record March 11; Preferred, $1.75, quarterly, payable April 2 to holders of record March 11.

Railway Officers

EXECUTIVE

Walter U. Appleton, general manager of the Atlantic region of the Canadian National, with headquarters at Moncton, N. B., has also been appointed vice-president of that region. Mr. Appleton was born on January 29, 1878, at Moncton and entered the service of the Intercolonial, now a part of the Canadian National, as a junior clerk in October, 1890. He served successively until October, 1913, as machinist apprentice, machinist, chief clerk, assistant to superintendent of motive power and as general master mechanic for the Intercolonial. When the Intercolonial became part of the Canadian Government Railways, Mr. Appleton, in February, 1918, was appointed superintendent of motive power, and in December of the same year was made mechanical superintendent. With the amalgamation of the Canadian Government Railways into the Canadian National System, Mr. Appleton, in September, 1920, was appointed general superintendent of rolling stock. On March 1, 1923, he was appointed general superintendent of the Atlantic region and on April 15, 1924, he became general manager of that region.

W. U. Appleton

MECHANICAL

W. L. Trout has been appointed general master mechanic of the Minneapolis & St. Louis with headquarters at Minneapolis, Minn. The positions of superintendent of motive power and rolling stock and of master mechanic, which have been held by H. W. Johnson and L. M. Chapman respectively have been abolished.

OPERATING

V. D. Thayer, whose appointment as superintendent of car service for the Delaware, Lackawanna & Western was noted in the *Railway Age* of February 23, entered the employ of the Lackawanna as office boy in the car accounting department in 1900, subsequently becoming chief clerk. After a brief absence in 1917-18, he reentered the service of the Lackawanna and was made car accountant in December, 1919. He was promoted to car service agent in April, 1933, the position he held at the time of his recent appointment.

V. D. Thayer

TRAFFIC

S. A. Dobbs, general agent at New Orleans, La., for the Gulf, Mobile & Northern, has been appointed executive general agent with the same headquarters.

George E. Hardy, traveling freight agent on the Great Northern at Spokane, Wash., has been promoted to general agent, with the same headquarters, to succeed **John M. Doyle,** deceased.

Luther Fuller, general industrial and agricultural agent for the Chicago & Eastern Illinois, with headquarters at Danville, Ill., has resigned to accept a position with the federal government as land planting consultant for the state of Alabama.

OBITUARY

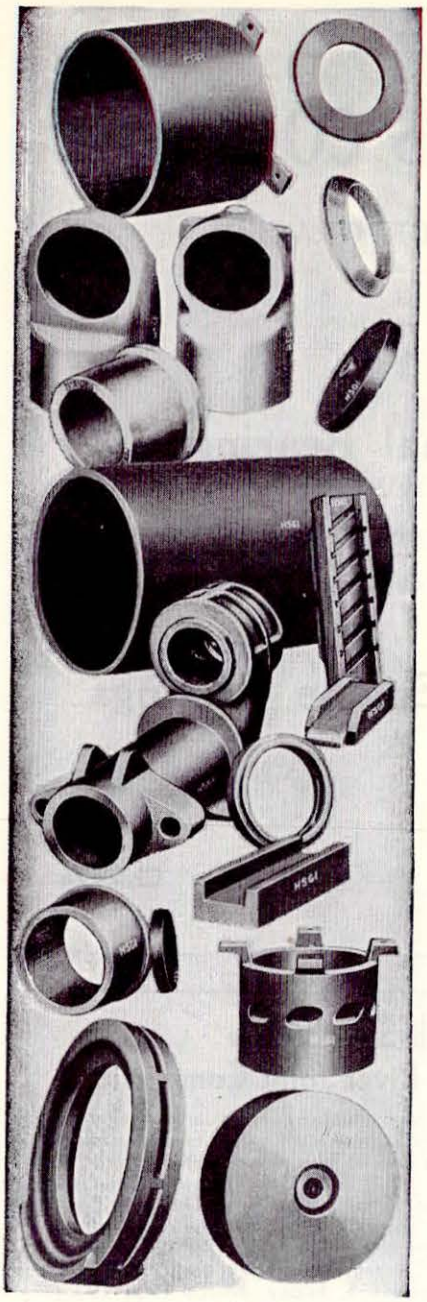
Walter I. Cook, who retired in 1904 as superintendent of locomotive service of the Chicago & Eastern Illinois, died at Tab, Ind., on February 12.

John H. Layman, general agent for the Chicago Great Western, with headquarters at Portland, Ore., died on February 19, after years of service with this company.

Thomas R. Stewart, superintendent of Mount Clare shops of the Baltimore & Ohio, with headquarters at Baltimore, Md., died on February 19 at Bon Secours Hospital. Mr. Stewart was 72 years old.

W. Douglas Little, who retired in 1929 as assistant claim agent of the Chicago & North Western, with headquarters at Chicago, died at his home at Morrison, Ill., on February 24.

Harry D. Warner, paymaster of the Illinois Central, with headquarters at Chicago, died on February 24 at the Illinois Central hospital in that city. Mr. Warner was 65 years old and had been connected with the Illinois Central for 42 years.



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Many railroads have solved this problem by specifying valve and cylinder wearing parts made of HUNT-SPILLER *Air Furnace* GUN IRON.

Comparison of fuel records has proved to these railroads that the locomotives equipped with HUNT-SPILLER *Air Furnace* GUN IRON parts require less fuel per ton mile.

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Cylinder Bushings
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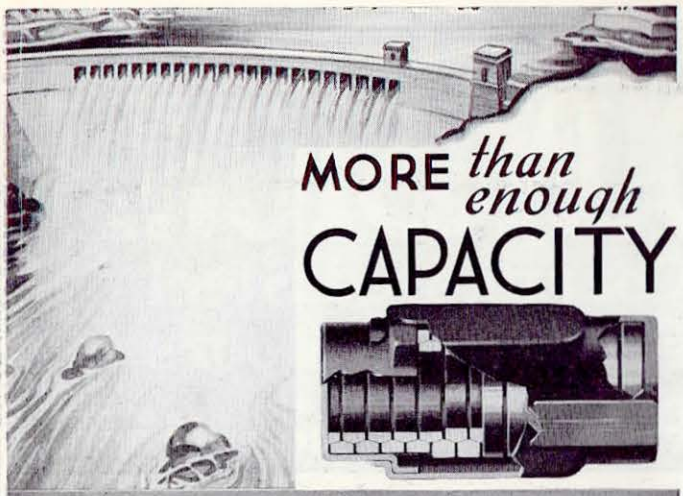

IN a reservoir Capacity is a vital necessity. The same is true of a Draft Gear.

Capacity measures the cushioning power of a Draft Gear. The Edgewater B-32-KA Gear has greater capacity than any other Gear fitting the standard A. R. A. pocket. It thus provides the greatest safeguard against shocks to car and lading.

Certified by American Railway Association

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RING SPRING
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Index to Advertisers

March 2, 1935

A

Agasote Millboard Co., The 28
Aluminum Company of America 9
American Arch Co., Inc. 21
American Locomotive Co. 23
American Sheet & Tin Plate Co. 15
American Steel Foundries 32
American Steel & Wire Co. 10, 15

B

Baldwin Locomotive Works, The 2
Belmont Iron Works 29
Bixby, Inc., R. W. 29
Burroughs Adding Machine Co. 16
Byers Company, A. M. ..... Front Cover

C

Camel Sales Company 29
Carnegie Steel Co. 15
Classified Advertisements 29
Columbia Steel Co. 15
Commodore Hotel 26

D

Dearborn Chemical Company 12
Delaware River Joint Commission 26

E

Edgewater Steel Company 30

F

Franklin Railway Supply Co., Inc. 20

G

General Railway Signal Co. 4, 5
Get Together Department 29
Gold Car Heating & Lighting Co. 29
Griffin Wheel Company 8

H

Harbison-Walker Refractories Co. 21
Hunt, Robert W. 29
Hunt-Spiller Manufacturing Corp. 25

I

Illinois Steel Company 13, 15
Ingersoll-Rand Company 31
Iron & Steel Products Inc. 29

K

Kerite Insulated Wire & Cable Co., Inc., The 28

L

Lima Locomotive Works, Inc. 19
Locomotive Firebox Company 11

M

Magnus Company, Inc. 26
Miner, Inc., W. H. 3

N

National Bearing Metals Corp. 29
National Tube Company 15

P

Pantasote Company, Inc., The 28
Pantasote Leather Co., The 28
Professional Directory 29

R

Railway Educational Bureau 29
Reading Iron Company 28
Republic Steel Corporation 18

S

Simmons-Boardman Publishing Co. 28
S. K. F. Industries, Inc. 6, 7
Superheater Company, The 22

T

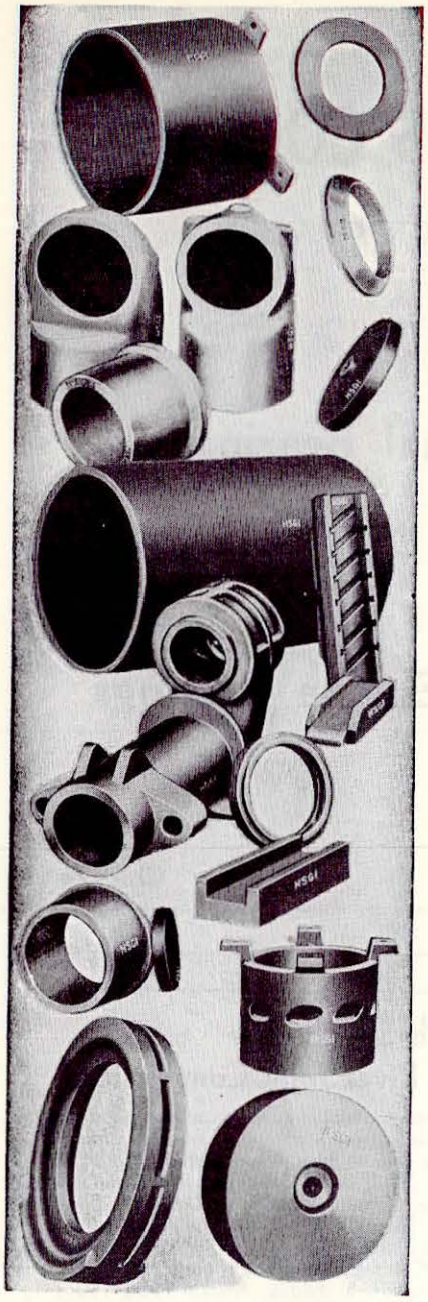
Tennessee Coal, Iron & Railroad Co. 15

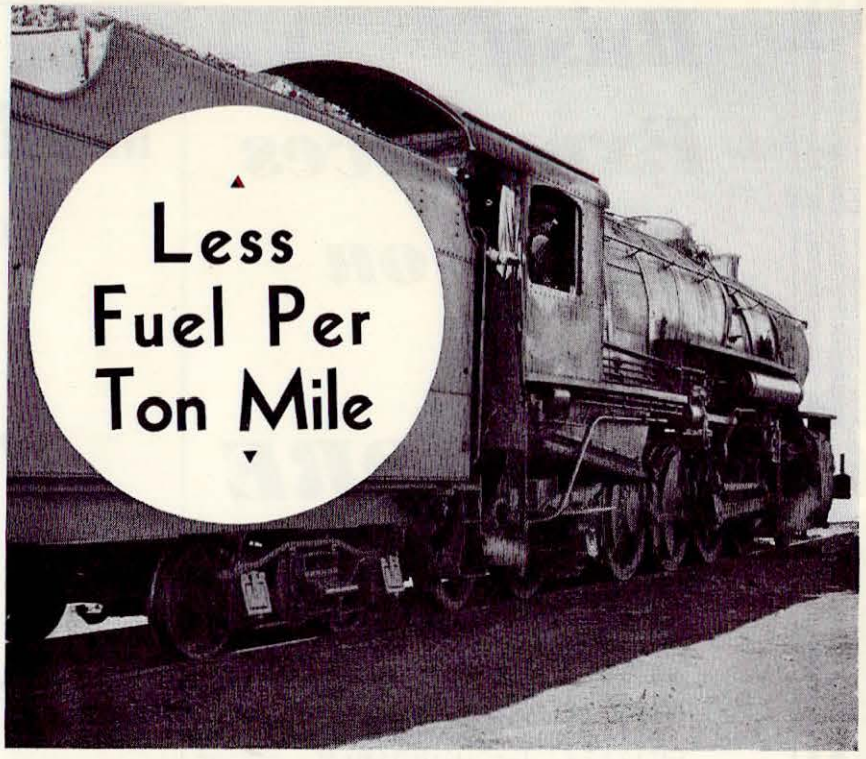
U

Union Switch & Signal Co. 24
U. S. Steel Corp. Subsidiaries 10, 13, 15

W

Walworth Company 14
Westinghouse Air Brake Co. 27
Wheel Truing Brake Shoe Co. 29





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A more complete description of the work and full information for bidders is given in the specifications and contract drawings which may be obtained upon deposit of $25.00 which will be remitted upon receipt of bid or the return in good condition of the copies so taken within thirty days after the opening of bids.

Without exception no bid will be considered unless the bidder executes Certificate of Compliance, U. S. Government Form P. W. A. No. 61, Revised March, 1934, to the effect that the bidder is complying with and will continue to comply with each applicable Code of fair competition, or in the absence of such Code or Codes, with the President's Reemployment Agreement. A copy of this Certificate included in the "Information for Bidders" must be executed.

Contractors shall pay all employees directly employed on the work the following minimum rates of wage, as prescribed by the Federal Emergency Administration of Public Works: Skilled, $1.20 per hour, Unskilled, $0.50 per hour, and Semi-skilled and others as called for in the Specifications.

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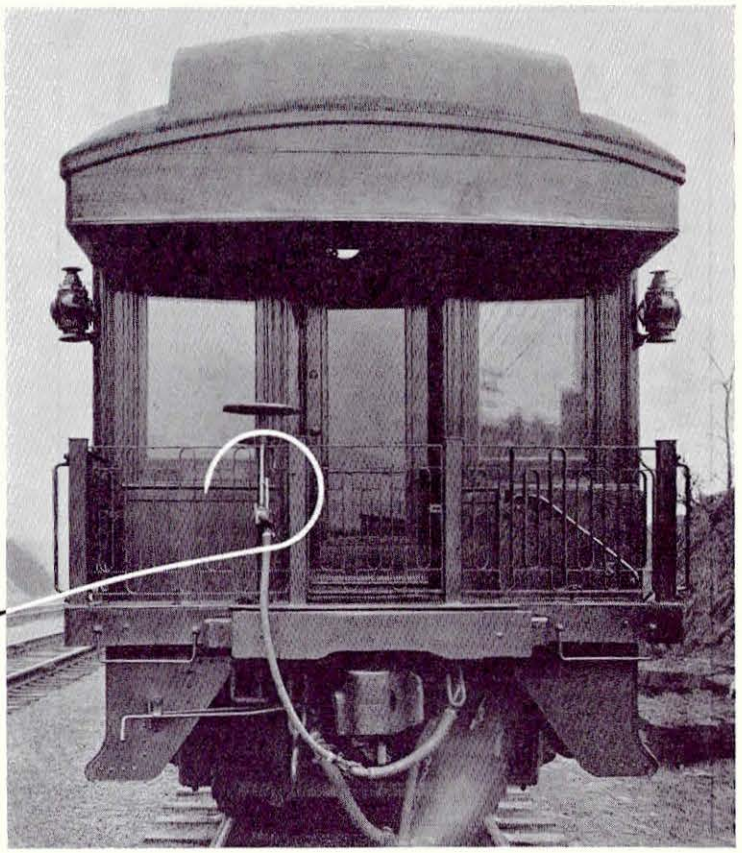

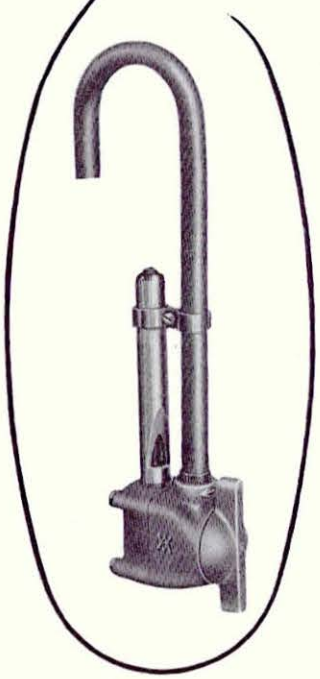

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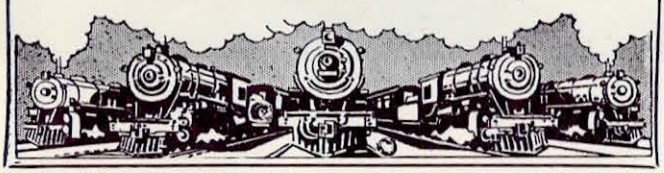

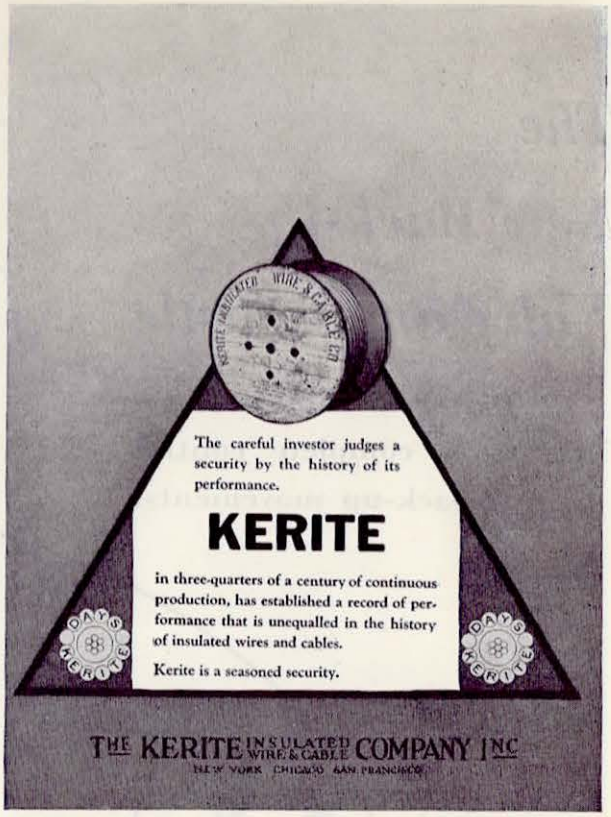
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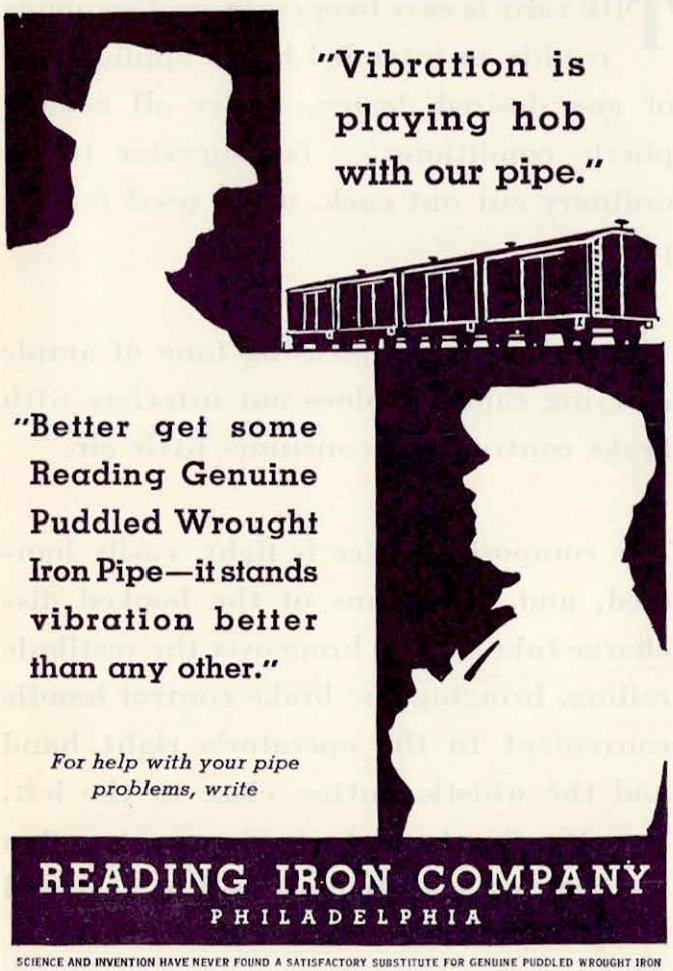
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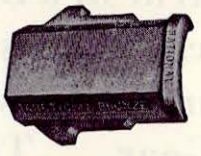
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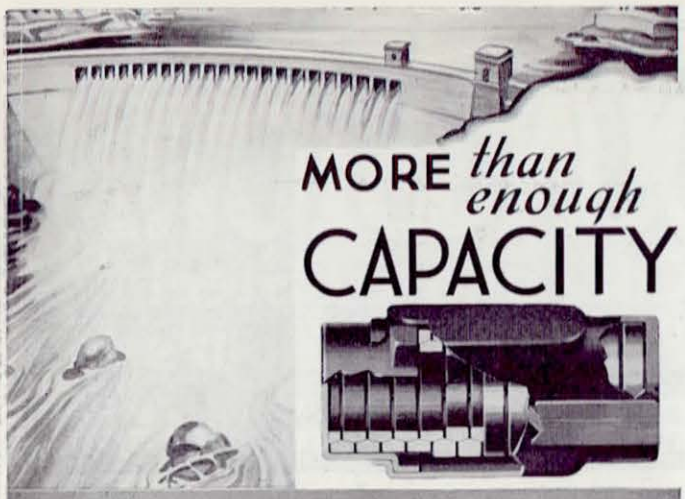

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Index to Advertisers

March 2, 1935

A

Agasote Millboard Co., The 28
Aluminum Company of America 9
American Arch Co., Inc. 21
American Locomotive Co. 23
American Sheet & Tin Plate Co. 15
American Steel Foundries 32
American Steel & Wire Co. 10, 15

B

Baldwin Locomotive Works, The 2
Belmont Iron Works 29
Bixby, Inc., R. W. 29
Burroughs Adding Machine Co. 16
Byers Company, A. M. ..... Front Cover

C

Camel Sales Company 29
Carnegie Steel Co. 15
Classified Advertisements 29
Columbia Steel Co. 15
Commodore Hotel 26

D

Dearborn Chemical Company 12
Delaware River Joint Commission 26

E

Edgewater Steel Company 30

F

Franklin Railway Supply Co., Inc. 20

G

General Railway Signal Co. 4, 5
Get Together Department 29
Gold Car Heating & Lighting Co. 29

H

Harbison-Walker Refractories Co. 21
Hunt, Robert W. 29
Hunt-Spiller Manufacturing Corp. 25

I

Illinois Steel Company 13, 15
Ingersoll-Rand Company 31
Iron & Steel Products Inc. 29

K

Kerite Insulated Wire & Cable Co., Inc., The 28

L

Lima Locomotive Works, Inc. 19
Locomotive Firebox Company 11

M

Magnus Company, Inc. 26
Miner, Inc., W. H. 3

N

National Bearing Metals Corp. 29
National Tube Company 15

P

Pantasote Company, Inc., The 28
Pantasote Leather Co., The 28
Professional Directory 29

R

Railway Educational Bureau 29
Reading Iron Company 28
Republic Steel Corporation 18

S

Simmons-Boardman Publishing Co. 28
S. K. F. Industries, Inc. 6, 7
Superheater Company, The 22

T

Tennessee Coal, Iron & Railroad Co. 15

U

Union Switch & Signal Co. 24
U. S. Steel Corp. Subsidiaries 10, 13, 15

W

Walworth Company 14
Westinghouse Air Brake Co. 27
Wheel Truing Brake Shoe Co. 29

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